EFFECTIVENESS OF KANGAROO MOTHER CARE (KMC) ON LEVEL OF PHYSIOLOGICAL PARAMETERS AMONG PRETERM INFANTS AT SELECTED HOSPITALS, NAGERCOIL, 2016.

DISSERTATION SUBMITTED TO

THE TAMIL NADU DR.M.G.R.MEDICAL UNIVERSITY

CHENNAI

IN PARTIAL FULFILMENT OF REQUIREMENT FOR THE DEGREE OF

MASTER OF SCIENCE IN NURSING

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Certified that this is the bonafide work of

Ms. CHANDRALEKHA.E
Omayal Achi College of Nursing
No. 45, Ambattur Road, Puzhal,
Chennai – 600 066

COLLEGE SEAL :

SIGNATURE : _____

Dr. (Mrs.) S.KANCHANA
R.N., R.M., M.Sc.(N)., Ph.D., PDF.(R).,
Principal & Research Director, ICCR,
Omayal Achi College of Nursing,
Puzhal, Chennai – 600 066, Tamil Nadu.

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Approved by the Research Committee in December 2014

PROFESSOR IN NURSING RESEARCH
Dr. (Mrs.). S. KANCHANA _____
R.N., R.M., M.Sc.(N)., Ph.D., PDF.(R).,
Principal & Research Director, ICCR,
Omayal Achi College of Nursing,
Puzhal, Chennai-600 066, Tamil Nadu.

MEDICAL EXPERT
Dr. M.THIRAVIAM MOHAN, MBBS, DCH., _____
Pediatrician & Neonatologist,
Dr.Jeyasekharan Hospital, Nagercoil – 629003.

CLINICAL SPECIALITY -HOD
Mrs. RUTHRANI PRINCELY.J _____
R.N., R.M., M.Sc.(N).,[Ph.D].,
Head of the Department,
Child Health Nursing,
Omayal Achi College of Nursing,
Puzhal, Chennai - 600 066, Tamil Nadu.

CLINICAL SPECIALITY- RESEARCH GUIDE
Ms. NANDHINI. P _____
R.N., R.M., M.Sc.(N).,
Nurse Researcher cum Assistant Professor,ICCR,
Child Health Nursing,
Omayal Achi College of Nursing,
Puzhal, Chennai - 600 066, Tamil Nadu.

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LIST OF ABBREVIATIONS

AAP	-	American Academy of Paediatrics
ANOVA	-	Analysis of Variance
APGAR	-	Appearance, Pulse, Grimace, Activity, Respiration
CNE	-	Continuing Nursing Education
C	-	Celsius
CHDC	-	Child Health Development Centre
CINHAL	-	Cumulative Index to Nursing & Allied Health
D.F	-	Degree of Freedom
EMBASE	-	Excerpta Medica Database
EBSCO	-	Elton Bryson Stephens Company
IFPB	-	Indian Foundation for Premature Babies
IAP	-	Indian Academy of Paediatrics
ICCR	-	International Centre for Collaborative Research
KMC	-	Kangaroo Mother Care
MEDLINE	-	Medical Literature Analysis and Retrieval System Online
MBBS	-	Bachelor of Medicine / Bachelor of Surgery
NICU	-	Neonatal Intensive Care Unit
NNF	-	National Neonatal Forum
NMR	-	Neonatal Mortality Rate
Psych INFO	-	Psychological Information Database
RNRM	-	Registered Nurse Registered Midwife
SEMG	-	Surface Electro Myo Graphy
SIDS	-	Sudden Infant Death Syndrome
U.K	-	United Kingdom
WHO	-	World Health Organization

LIST OF SYMBOLS

χ^2	-	Chi square
=	-	Equals To
<	-	Less than
>	-	More than
%	-	Percentage
p	-	Level of significance
n	-	Number of samples
N	-	Total number of samples
°	-	Degree
+/-	-	Plus or Minus

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ABSTRACT

Effectiveness of kangaroo mother care on level of physiological parameters among preterm infants at selected hospitals, Nagercoil.

Aim and Objective: To assess the effectiveness of Kangaroo Mother Care on level of physiological parameters among preterm infants. **Methodology:** Quantitative approach, Quasi experimental pre and post test research design was adopted to assess the effectiveness of Kangaroo Mother Care on level of physiological parameters among 60 preterm infants (30 in study and 30 in control group) who satisfied the inclusion and exclusion criteria in Neonatal Intensive Care Unit (NICU) at Dr.Jayasekaran and Dr. Jayaharan Hospitals, Nagercoil. Non-probability purposive sampling technique was used to select the samples. Kangaroo Mother Care along with hospital routine (warmer care) was performed in to the study group and hospital routine (only warmer care) was given to the control group. The pre and post test level of physiological parameters was assessed by using World Health Organization (WHO) guidelines. **Results:** The study findings revealed that there was no significant difference in the pre test level of physiological parameters among preterm infants between study and control group. The calculated unpaired 't' value of physiological parameters such as temperature, heart rate, respiratory rate, oxygen saturation and weight of preterm infants after providing KMC for 30 minutes three consecutive days was 11.29°C ; 13.48 beats per minute; 14.85 breath per minute; 8.59 % respectively which shows that there was high statistical significant difference between the study and control group at $p<0.001$ level. **Conclusion:** The results revealed that the Kangaroo Mother Care for 30 minutes for three consecutive days was effective in improving the physiological parameters among preterm infants. Hence, in this duration of KMC can be practiced as a part of routine nursing care for stable preterm infants during hospitalization.

Keywords: *,kangaroo mother care, preterm infants, physiological parameters, WHO guidelines.*

INTRODUCTION

Preterm infants are born too earlier in time they reach their full gestational age of 40 weeks, in which the preterm infant's loss their time, to grow in their mother womb, leads to structural and physiological immaturity. As a consequences preterm infant looking very thin, red, smoothie, wrinkled, fragile skin and weight less appearance because of minimal deposition of subcutaneous fat. Preterm infants are vulnerable to many impediment and complications in the first few weeks of life due to immaturity of the body system.

The structural and functional immaturity of neuro behavioral development of the preterm infants results dishevelment of nervous system, physiological function, stress and behavior. The adaptation of postnatal preterm infant's in their extra uterine life,

challenges to maintain the physiological parameters of the body temperature, heart rate, respiration, oxygen saturation, weight in their new environment and higher risk for potential complications. Thus, the preterm infants needs additional energy, stay with warm, support for feeding, free from infection and maintain the stable physiological parameters in their postnatal period of life. There are various measures are used to stabilize the preterm infants like radiant warmer, incubators, mummification, nesting, swaddling and KMC.

Kangaroo Mother Care is a non-invasive, cost effective, therapeutic motherly based care and its promotes breast-feeding, maintain thermal stability, promotes physiological and behavioral effects and promotes weight gain, reduce the length of hospital stays also enhance the humanization, and bonding between the mother and the preterm infants.

The investigator during her clinical experience identified that preterm infants are unable to maintain the physiological parameters within normal limits. They need assistance and supportive measures to maintain the normal physiological parameters. Many studies focused the effectiveness of KMC with 24 hours, 8hours, 4 hours, 2 hours and 1hour of duration. Due the maternal factors such as stress, anxiety in handling the preterm infants, pain due to birth process, co morbid illness of preterm infant has increased stay in NICU. So that the mothers of preterm infants unable to perform KMC for longer duration. Hence, research investigator wants to minimize time duration, reduce the constraints and assessed the effectiveness of Kangaroo Mother Care for 30 minutes for three consecutive days on level of physiological parameters among preterm infants.

Objectives

1. To assess and compare the pre and post test level of physiological parameters among preterm infants in study and control group.
2. To assess the effectiveness of KMC on level of physiological parameters among preterm infants.
3. To associate the selected demographic variables with the mean differed score of physiological parameters among preterm infants in study and control group.

Null hypotheses

NH_1: There is no significant difference between effectiveness of KMC on level of physiological parameters among preterm infants in study and control group at $p<0.05$ level.

NH_2: There is no significant association of selected demographic variables with mean differed score of physiological parameters among preterm infants in study and control group at $p<0.05$level.

METHODOLOGY

A quasi-experimental pre and posttest control group research design was adopted in order to assess the effectiveness Kangaroo Mother Care on level of physiological parameters among preterm infants. The independent variable of this study was Kangaroo Mother Care. The dependent variables were physiological parameters. The study was conducted in the NICU of Dr. Jayasekaran and Dr. Jayaharan hospitals, Nagercoil. The study population includes preterm infants between 26-36 weeks of gestation admitted in the NICU. The sample size consisted of 60 preterm infants (who fulfills the inclusion and exclusion criteria) selected by non-probability purposive sampling technique. The study included the preterm infants who where hemodynamically stable, birth weight more than 1500 grams and admitted in the NICU. The study excluded mothers of preterm infants who were affected with contagious disease and who was not willing to provide KMC.

The tool consisted of two parts i.e., data collection tool and intervention tool. The data collection tool used in this study was structured interview schedule and medical record review for demographic data, WHO guidelines was used to assess the level of physiological parameters of the preterm infants. After preparation of articles, environment, preterm infant and mothers of preterm infants, the investigator wore cap and mask, performed hand hygiene and monitored the physiological parameters such as temperature heart rate, respiratory rate oxygen saturation and weight of the preterm infants was recorded. The investigator assisted the mother to perform KMC with the preterm infants for 30 minutes by placing the preterm infant between the mothers breast, in a perpendicular position such that the head is turned to one side in slightly extended position, flexed and abducted the arms, hip in a frog like position. The investigator placed the preterm abdomen at the level of mother's epigastrium, asked the mother to hold the preterm infants and then the investigator supported both the mother

and the preterm infant by autoclaved cotton sheet for 30 minutes for three consecutive days. After the intervention of KMC preterm infant placed in a comfortable position. The investigator checked and documented the physiological parameters after the procedure for three consecutive days. Preterm infants are allowed to perform their routine activities.

RESULTS AND DISCUSSION

The findings of the study revealed that KMC for 30 minutes for three consecutive days among preterm infants between study and control group, there was no significant difference in pretest level physiological parameters among preterm infant between study and control group.

The post test mean difference and calculated unpaired 't' value founded after the intervention of KMC along with the hospital routine for physiological parameters such as temperature was 0.93,11.29 & heart rate was 9.96,13.48 & respiratory rate 8.26,14.85 & oxygen saturation 2.63,8.59 and weight was -12.43,-0.18 respectively. The calculated unpaired 't' value shows there was statistically high significant difference in the post test level of physiological parameters among preterm infants between study and control group at $p<0.001$ level

Thus, the null hypothesis NH_1 stated earlier **"There is no significant difference between pre and post test level of physiological parameters among preterm infants between study and control group at P< 0.05 level was rejected."**

The study findings were analyzed by using of one way analysis of variance. The One way ANOVA 'F' test was used for association. In study group the calculated 'F' value indicated there was significant association of physiological parameters of temperature with gestational age, weight, drugs given during the study period, duration of hospital stay and frequency of feeding. The physiological parameters of respiratory rate associated with the variables of occupation of the mothers of preterm infants. The physiological parameters of oxygen saturation associated with the variables of gender and occupation and physiological parameters of weight associated with the variables of drugs given during the study period. In control group, the calculated 'F' value indicated there was significant association of the physiological parameters of temperature with the variables of weight, respiratory rate associated with the variables of gestational age, heart

rate associated with the variables of drugs given during the study period and oxygen saturation associated with the variables of weight and frequency of feeding.

Hence the null hypothesis $\mathbf{NH_2}$ stated earlier "**There is no significant association of selected demographic variables with the mean differed score of physiological parameters among preterm infants in study and control group at P< 0.05 level" was rejected**

CONCLUSION

The findings proved that the KMC for 30 minutes for three consecutive days was effectively improving the physiological parameters among preterm infants. Kangaroo Mother Care also improved the behavioral and psychological wellness of the preterm infants. The health care providers in their practice while caring for the preterm infants in the NICU, postnatal ward and home settings can utilize KMC. Hence, it can be used as a simple, cost effective, motherly based nursing measure for improving the physiological parameters of the preterm infants and it can used as a routine care of preterm infants.

IMPLICATIONS

The nurse can adopt KMC as a safe, secure and comfortable daily nursing practice for all stable preterm infants as well as term infants at their clinical areas of practice. The nurse educator can incorporate the major study findings in the nursing curriculum at various levels to develop and well equip the staff nurses in the NICU's in order to identify and improve the immaturity levels of preterm infants. The findings of the study can be disseminated to the nurses working in various institutions and student nurses through media and also can train their mothers as a part of preterm care to improving the physiological parameters home settings. The nurse administrator should take initiation in organizing CNE, conferences and workshop on various trends of KMC on level of physiological parameters in order to reduce the complication among preterm infants. The nurse researcher can generalize the study results by replicating the study with larger population.

CHAPTER – 1

INTRODUCTION

INTRODUCTION

Premature infants are those who are born near term or earlier in time they reach their full gestational age of 40 weeks, in which the preterm infant's loss in time, to grow in their mother womb, leads to immature development of the systemic organs. These infants are speculating for future health problems and disparities in their development.

Infants are born between 34 to 36 weeks of gestation are said to be late preterm infants, between 32 to 34 weeks of gestation are considered as a moderately preterm infants, babies born between 28 to 32 weeks of gestation are very preterm infants, whereas infants born at less than 28 weeks of gestation said to be extremely preterm infants. World Health Organization, (WHO) Fact sheet, 2015

Preterm infants look very thin, weigh less due to fewer amounts of subcutaneous fat and muscles in their body; as a result, the preterm infant's skins are very thin, red, smoothie, shiny, wrinkled and too fragile. Less subcutaneous fat and muscles produce jerky movements, lack muscle tone, poor sucking and extremities are in outstretched position. Lungs and other organs are under developed.

Preterm infants are often subject to many impediment and complications in the first few weeks of life due to immature body system. Preterm infants are at higher risk for breathing problems (difficulty in breathing, respiratory distress, broncho pulmonary dysplsia and apnea), cardiac problems (patent ductus arteriosus, low blood pressure), brain problems (intra ventricular hemorrhage, hydrocephalus, cerebral palsy, impaired cognitive skills,) temperature control problems (hypothermia produced hypoglycemia). Preterm infants also suffer with gastro intestinal, metabolic, blood, immune, vision, hearing, dental, behavioral and psychological impairment, other various medical complication and intermittent hospitalization of neonatal period. (Child Health Development Centre 2013, U.K).

Preterm birth perished the neurobehavioral development of the infants, as a result of dishevelment of nervous system, physiological function, stress and behavior. Adaptation of postnatal preterm infants challenges to maintaining the physiological

parameters of the body temperature, heart rate, respiration, oxygen saturation, weight in their extra uterine life and higher risk for potential complications. Thus, the preterm infants need to maintain the stable physiological parameters in their postnatal period of life. There are various measures which can be used to stabilize the preterm infants like radiant warmer, incubators, mummification, nesting, swaddling, KMC. Kangaroo Mother Care is a non-invasive, cost effective therapeutic measure to improve the physiological parameters of the preterm infants.

1.1 BACKGROUND OF THE STUDY

The premature infants are extra uterine fetus that are born too soon and survives very dramatically. More than 80 % infants born between 32-37 weeks of gestation age lose their life without the essential care. (Born Too Soon 2013). The extra uterine fetus are challenges to their new environment and needs additional energy, to stay with warmth, support for feeding, breathing, free from infection ,enough oxygen, and without disabilities.(WHO,2013)

Globally 15 million infants are born too early each year; 1 million of infants woefully lose and fight for life from preterm birth complications. In United States, the occurrence of preterm birth in one in every 10 babies and 12 in 100 live births of preterm infants. In U.K 85% infants are born prematurely with very low birth weight of 1000 gm and 94% babies born 24 weeks of gestation (Centre for Disease Control and Prevention 2014).

Premature birth in developing countries is the extensive global killer of young children; with more than millions of children lose their life in every year. Half of the infants born in low-income countries are below 32 weeks and fail to win their life due to lack of feasible and cost effective care. 12% of babies born too early in low-income countries when compared to higher income countries it is 9% of babies. (National Neonatal Forum 2015).

In Africa and South Asia 60% preterm infants are born in each year. In India, it was estimated 27 million babies born in a year and 3-4 million babies are born with prematurity. 3,00,0000 of neonatal death happen in each year in India due to premature medical complication (Express News Service, New Delhi 2014).

In terms of preterm birth WHO, fact sheet updated the top ten countries highest number of preterm birth.

Table 1.1.1 Preterm birth rate in the top ten countries

S.No.	Countries	Number of preterm birth
1	India	3519100
2	China	1 172 300
3	Nigeria	773 600
4	Pakistan	748 100
5	Indonesia	675 700
6	United States of America	517 400
7	Bangladesh	424 100
8	Philippines	348 900
9	The Democratic Republic of the Congo	341 400
10	Brazil	279 300

Source: (WHO Fact Sheet No 363, November 2015)

In terms of Neonatal Mortality Rate (NMR) among 199 countries, India has the highest number of death because of prematurity and it has placed 36 in rank order (The Hindu -2012). The NMR in India from 52 per 1000 live birth in 1990 to 28/1000 live birth in 2015. In Delhi 64% newborn death, occur within the first 28 days. In views of Mumbai and Kolkata the NMR is 20 per 1000 live birth, Chennai it was 15 per 1000 live birth, in Dharmapuri the NMR rate was 21 per 1000 live birth, in view of Salem the NMR rate was 13 per 1000 live birth. The NMR of Kanyakumari the NMR was 13 per 1000 live birth, due to high literacy and health awareness it does not exceed more than 20 per 1000 live birth. (The Hindu, Feb 2014).

The extra uterine fetus undergoes an accepted sequence of events to become familiar with the extra uterine life. When the preterm infants are born, they undergo greatest challenges to adapt the extra uterine life than the normal term babies.

Dr.Rajeeve Tandon, Senior Advisor Maternal Child and Newborn Health, (2011) said that preterm infants need more concentration and interventional measures for overcoming the medical, developmental, behavioral complication of preterm birth.

According to Indian Foundation for Premature Babies (IFPB), 75% preterm infants need simple intervention than any other advanced technologies. The causes of highest mortality and morbidity in newborns are preterm birth. Care of preterm infants with pathological and physiological functions such as thermoregulation, poor sucking and swallowing co-ordination.

Currently three quarters of extra uterine fetus are rescued by cost effective interventions throughout the nursing practices as heel stick lancing procedures, changing the diapers, position changing etc. Throughout these practices, the preterm infants need to overcome many challenges in order to establish themselves.

Premature birth is the major challenges and its directing the cause of death especially in neonatal period. Preterm infants subjected to short term and long-term consequences such as hypothermia, hypoglycemia, respiratory and cardiovascular derangement and longer period of hospitalization.

Preterm infants are unable to support their own respiration (immaturity of the lungs), prone to infection (immature immune system), become jaundiced (immaturity of the liver), poor tolerance to feeding and long time nothing by mouth (immaturity of the gastro intestinal system). The brain blood vessels are very thin and fragile that leads to intra cranial and intra ventricular hemorrhages, apnea (immaturity of the central nervous system).WHO (2015) developed a guidelines for improving survival and reduce the complication of the preterm infants and strongly recommended that KMC as a routine care of clinically stable newborn infants less than 2000 grams.

In Sweden, Dr. Peter De Chateau, was described the word "early contact with mother and baby at birth, followed by Dr. Thomson used the word of skin-to-skin contact. In 1978, there was an increased incidence of mortality and morbidity rates in the Institute of Maternal Infant, NICU in Bogota, Colombia. Dr. Edgar Rey Sanabria, Neonatologist, who was introduced Kangaroo Mother Care, in order to alleviate the inadequacy of caregiver and resources.

Thermo regulation is very important to the care of preterm infants. The immaturity of the heat-regulating centre of hypothalamus, infants are not able to regulate

the body temperature. Karlson et al (2012) conducted a study on effectiveness of KMC on level of thermoregulation among preterm infants and found that KMC has a positive effect by maintaining the body temperature of the preterm infants. Tourneux et al (2010) identified that the preterm infants are using their energies for basic metabolism, temperature regulation and body growth.

Kangaroo Mother Care is a powerful and cost effective method, by placing the preterm infants in a perpendicular position between the mother breasts. KMC Promotes breast-feeding, maintaining the thermal stability, promotes physiological and behavioral effects, and promotes weight gain, reduce the length of hospitalization. KMC is a powerful and cost effective method for caring the preterm infants and enhances the humanization, bonding between the mother and the preterm infants. Multiple researchers (Jacqueline smith, 2012; Charpak, Z. Figueroa, (2012); Ranganadhar Suter, Suryakanta Baraha, Prithive Surekha, 2015; Schindler, Natalie, Lynn, Kathryn, 2015) said that KMC is equivalent to conventional care (incubators) in terms of safety and thermal protection. It enhances breast-feeding and contributes to humanization of newborn care, bonding between the mother and the preterm infants. Cong, Ludington-hoe, Mc Cain, Fu,(2010); found that KMC stimulates the sensory, emotional, tactile, proprioceptive, vestibular, olfactory, auditory, visual and thermal stimulation. Chiu Anderson (2010) analyzed that KMC promotes the physiological effects of quiet sleep ,stable thermoregulation, heart rate, respiratory rate, oxygen saturation.

The mother's body is the best environment for the growth and development of the preterm infants. Preterm babies when placed on the mother chest with skin-to-skin contact, received warmth, protection, nutrition and brain development. While skin-to-skin, contact the C- afferent nerves of the infant mother and infants chest region react to the pleasure of humanity touch of KMC. The pleasurable touch sensation is transmitted into the insular cortex of the brain. The pleasurable touch sensation caused to act on the oxytocin it is a bonding hormone, hormone of love and attachment. Oxytocin acts on the brain stem, without delay calms and stabilize the cardio respiratory functions. Qualitative changes happen in the brain stem from Sympathetic to Para sympathetic control. It means stress, hyperactive alertness and reactivity, improvement in the physiological functions, sense of threat to relaxation, calm, contentment, and safety. Tachycardia occurs because of supine position to upright position.

Maternal – preterm skin-to-skin contact augment the physiological function and cognitive control of the preterm infants for the first ten years of life. It also enhances the physiological body system including stress reactivity, autonomic function, sleep pattern, support to maturation of the pre frontal cortex and makes certain effects on cognitive and behavioral control (Rosenthal boil-psychiatry 2014).Premature birth disorganized the brain development, and it has combined with maternal separation and contact sensitive system. Skin to skin contact was making better for the long-term actions and activities of these system.

Hospitalization of the preterm infants undergone various therapeutic procedures such as heel stick lancing, frequent lab investigations are hemoglobin, hematocrit, bilirubin and electrolytes (Davidson 2012).These painful sensation produce physiological and behavioral disruptions. Kangaroo Mother Care reduced the painful response and its acts as a non-pharmacological analgesics effect on the preterm infants (Ludington-hoe 2010).

Hussein et.al (2011) conducted a study to assess the impact of KMC on the infant responses to the pain. He found that infants who were underwent KMC, infants enter into a state of deep sleep that time pain full stimulus produced. Infant responded to the painful stimulus, the heart rate and crying responses significantly decreased.

Therefore, the research investigator during her clinical experience in NICU and wards recognized the importance and potential benefits of physiological parameters on the delegate features of the preterm infants. The investigator also sensitized KMC as simple, cost effective and motherly based care that effectively maintains the physiological parameters, and provides various opportunities for the growth of the preterm infants.

1.2 SIGNIFICANCE AND NEED FOR THE STUDY

The arrival of preterm birth produced various consequences between the mother and the infants. Preterm infants are very little, responds poorly to the sound, smiles, and play activity. (Beckwith, Cohen, 2010). Preterm infant`s mothers stressed perceive the sense of guilty feeling, about sudden unexpected termination of pregnancies. (Miles et al,(2010), Affonso et al,(2009). Nashwa, M, Samra, Amal, E.l, Taweel, Karin Cadwell,

(2013); conducted a study to assess the effectiveness of intermittent Kangaroo Mother Care on weight gain among preterm infants. Preterm infants are selected based on his criteria and introduced Kangaroo Mother Care for 24 hours per day. Researchers used both the mother and the father as a Kangaroo Care Provider. Study revealed that Kangaroo Mother Care is easy, safe, feasible, effective method of improving the weight gain of the preterm infants.

Mwendwa, A.C, Musoke, R.N, Wamalwa D.C,(2012); conducted a study to assess the impact of partial Kangaroo Mother Care on growth rate and duration of hospital stays among preterm and low birth weight babies. Kangaroo Mother Care provided 8 hours per day. Study shows that significantly increasing the weight, head circumference, mid upper arm circumference, and the hospital duration also decreased.

Multiple Indian researchers (Parmar, V.R, Kumar A, Kaur, R, Parmar,S, Kaur, D, Basu S, Jain,S, Narula S (2010) conducted a study to assess the feasibility, acceptability of Kangaroo Mother Care on the low birth weight and preterm infants in Neonatal Intensive Care Unit. Preterm infants up to 30-36 weeks of gestation and weight 1500-2500 grams. Preterm infants underwent 4 hours of Kangaroo Mother Care for 7 days. Researchers found that the physiological parameters of temperature increased from 36.75 to 37.24, heart rate decreased by 3-5 beats, stabilized respiration and oxygen saturation 2-3 % improved statistically.

Indian researchers Rangadhar Sutar, Suryakanta Baraha, Prithi Sureka Mummidi, (2015), conducted a study to compare the effectiveness of common vital parameters of preterm infants between the Kangaroo Mother Care with radiant warmer and standard radiant warmer. Researcher's have selected preterm infants between 32-34 weeks, weight more than 1200 grams and medically stable infants. Kangaroo Mother Care was administered 2 hours per day for 14 days along with warmer care. Researcher found that significantly improved the physiological parameters and fewer episodes of apnea and desaturation present in the Kangaroo Mother group where as in other group infants had frequent episodes of apnea and desaturation. Researcher's concluded that Kangaroo Mother Care reduced the bradycardia, apnea, and desaturation of preterm infants.

Sivapriyal, S, Jeyagowri, S, (2015); conducted a study to assess the therapeutic effect of Kangaroo Mother Care on preterm infants. Researcher identified the physiological and behavioral response of the preterm infants after one hour of Kangaroo Mother Care. Researchers founded that Kangaroo Mother Care act as a human incubator it is the easiest way to improved the physiological behavioral responses of the preterm infants.

The variation of physiological parameters depends upon the physical development and maturation, aging, gender, body surface area, diurnal and other rhythms. Verma P Verma (2014) conducted a study to assess the effectiveness Kangaroo Mother Care on level of heart rate, respiratory rate and temperature among preterm low birth weight infants. He administered Kangaroo Mother Care for 30 minutes for the preterm infants and he evaluated pre and post KMC heart rate, respiratory rate and temperature. He measured the parameters once a day for three consecutive days. He proved that after the intervention of Kangaroo Mother Care the heart rate and the respiratory rate was insignificant and Kangaroo Mother Care was effectively maintaining the body temperature of the preterm infants and it was statistically significant.

Almeida CM, Almeida AFN, Forti EMP (2010) conducted the study on assessing the effects of Kangaroo Mother Care on the vital signs of low weight preterm infant. The basic vital parameters such as temperature, heart and respiratory rate, mean arterial pressure, auxiliary temperature, peripheral oxygen saturation of preterm infants, he assessed the preterm infants before 30 minutes and after the intervention for three consecutive days. Researcher's proved that Kangaroo Mother Care significantly improved by increased axillary temperature and oxygen saturation and the reduction of respiratory rate and suggested KMC bestows a quality of care towards alteration in the low weight preterm infant's vital signs.

The investigator during her clinical experience identified that preterm infants are unable to maintain the physiological parameters within normal limits. They need assistance and supportive measures to maintain the normal physiological functions. Many supportive measures are used to comforting the preterm infants like mummification, nesting, swaddling and KMC. Kangaroo Mother Care (KMC) is a low cost and cheapest, cost effective motherly based method for caring the preterm infants.

Many researchers studied the effect of KMC with 24 hours, 8hours, 4 hours, 2 hours and 1hour of duration. Due to the maternal factors such as stress, anxiety in handling the preterm infants, pain due to birth process and the preterm factors such as co morbid illness, increased hospitalization, the preterm infants mothers are unable to performing KMC for longer duration in their post natal period. Due to these constraints, the research investigator wanted to minimize the time and reduce the constraints; hence the research investigator assessed the effectiveness of Kangaroo Mother Care for 30 minutes in three consecutive days.

1.3 STATEMENT OF THE PROBLEM

A Quasi-experimental study to assess the effectiveness of Kangaroo Mother Care (KMC) on level of physiological parameters among preterm infants at selected hospitals, Nagercoil.

1.4 OBJECTIVES

1 To assess and compare the pre and post test level of physiological parameters among preterm infants in study and control group.
2 To assess the effectiveness of KMC on level of physiological parameters among preterm infants.
3 To associate the selected demographic variables with the mean differed score of physiological parameters among preterm infants in study and control group.

1.5 OPERATIONAL DEFINITIONS

1.5.1 Effectiveness

Refers to the physiological outcome of KMC on level of physiological parameters such as temperature, heart rate, respiratory rate, oxygen saturation and weight based on WHO guidelines after three days of intervention.

1.5.2 Kangaroo Mother Care (KMC)

Refers to the placement of preterm infants between the mother's breast in a perpendicular position such that the head is turned to one side in slightly extended position, flex and abduct the arms and hip in a frog like position. Placing the preterm abdomen at the level of mother's epigastrium and support both, the mother and preterm infant by autoclaved cotton sheet for a period of 30 minutes for three consecutive days

along with by hospital routine (placing the preterm infants in warmer after the intervention of KMC).

1.5.3 Level of Physiological parameters

Refers to the alteration in temperature, pulse, respiration, oxygen saturation and weight before and after KMC, which was assessed by WHO guidelines.

1.5.4 Preterm infant

Infant born between 26-36 weeks of gestation, weighing >1500 gms who were admitted in the Neonatal Intensive Care Unit (NICU) at selected hospitals.

1.6 ASSUMPTIONS

KMC may have an effect on level of physiological parameters among preterm infants.

1.7 NULL HYPOTHESES

NH_1: There is no significant difference between the effectiveness of KMC on level of physiological parameters among preterm infants in study and control group at $p<0.05$ level.

NH_2: There is no significant association of selected demographic variables with mean differed score of physiological parameters among preterm infants in study and control group at $p<0.05$ level.

1.8 DELIMITATION

The study was delimited to provide 30 minutes of KMC for three consecutive days.

1.9 CONCEPTUAL FRAMEWORK

Conceptual framework was a theoretical structure of assumptions, principles and rules that holds together, the ideas composed of broad concepts, harmonious arrangement and the relationship between the concepts pertinent to the study and it was made of concepts and proportions that state the relationship between the concepts relevant to the study. Conceptual framework provided a basement, to check for the occurrence of the

phenomena. It has helped the investigator to proceed with the research in an organized and orderly process by generating ideas for research.

The conceptual framework adopted for this study was based on Modified Kolcaba's theory of comfort. Katharine Kolcaba is an American Nursing theorist was born in 1944 at Ohio, U.S, She graduated with RN, RM from Frances Payane Bolton School of Nursing in 1987. Kolcaba developed the comfort theory, in the year of 1900 and she published an article of comfort theory and its application to the Child Health Nursing in the year of 2005. The comfort theory describes the existing approaches for the pediatric to relive the discomfort. It is a middle range comforting theory, for health practice, education and research. This model explains that comfort is a positive concept and it has associated with other activities that nurture and strengthen of preterm infants from an immediate desirable outcome of nursing care.

Katherine Kolcaba reported that the preterm infants might have various degree of discomfort that emerged from various health changes, she identified the association of health care needs, intervening variables and comforting interventions would promote enhanced comfort (relief, ease and transcendence) supporting the infants to achieve the health seeking behavior for the period of time. Ultimately guides to framing the best practices and best policies at the health care institution. The present study aimed to maintain the stable physiological parameters among preterm infants undergoing the comforting measures for 30 minutes of Kangaroo Mother Care for three consecutive days. The theorist states that best practices leads to better quality of life. The framework consists of four components: Health care needs, Comforting intervention, Enhanced comfort and Institutional integrity.

- **Health care needs of the preterm infant**

The theorist defined the health care needs as those needs identified by the patient and/or family in particular nursing practice settings. In this study, the investigator identified that the changes in the physiological parameters as the health care need of the preterm infants by assessing the demographic variables and the pretest level of physiological parameters by using the WHO guidelines.

- **Comforting interventions**

According to this theory, the enhanced comfort is the positive outcome of the nursing interventions of the health care needs, relief, ease and transcendence accomplish it. In this study, the investigator assessed the effectiveness of Kangaroo Mother Care on level physiological parameters among preterm infants, 30 minutes for three consecutive days. The proposed intervention along with hospital routine was administered to the study group and the control group allowed undergoing the hospital routine (warmer).

- **Enhanced comfort**

According to the comfort theory, the enhanced comfort is the immediate desirable outcome of the nursing care accomplished by relief, ease and transcendence. In this study, relief was the physiological problem of preterm infants, ease was the nursing interventions of Kangaroo Mother Care (30 minutes for three consecutive days) and transcendence was the phase where the preterm infants meet their health needs. The outcome assessed by the post test level of physiological parameters by using the WHO guidelines.

Reinforcement – if there was improvement in the physiological parameters after providing the Kangaroo Mother Care (30 minutes for three consecutive days),the investigator recommended for reinforcement of the intervention of Kangaroo Mother Care as a routine nursing interventions for the preterm infants.

Enhancement – if there was no improvement in the physiological parameters after providing the Kangaroo Mother Care reassessment was prescribed.

- **Institutional integrity**

Institutional integrity includes the best practices and best policies, which the institution frames as procedures and protocols for the overall use after collecting the evidences. In this study, the investigator reported the finding of the study to the hospital administrator and Kangaroo Mother Care for 30 minutes was implemented at Dr.Jayasekaran Memorial Hospital and Dr. Jayaharan hospital, Nagercoil.

The Medical Directors and the Neonatologist of both the Hospitals appreciated the findings of the study and accepted to implement Kangaroo Mother Care (30 minutes) as routine nursing interventions of preterm infants. Also ensured to provide training for the neonatal staffs as well as the mother to perform and follow the procedure of Kangaroo Mother Care (30 minutes) in to their home setup. Thus, the Kolcoba's theory of comfort was adopted by the investigator, which served as a perfect guidance for the logical framework development of the study, which delegated the investigator to sketch the outline for this study by giving related phenomena and concepts for preterm infants and attain the beneficial outcome by means of nursing interventions. This also allows the investigator to associate the various aspects of theory, implement into nursing practice, and identify the effectiveness of Kangaroo Mother Care on level of physiological parameters among preterm infants.

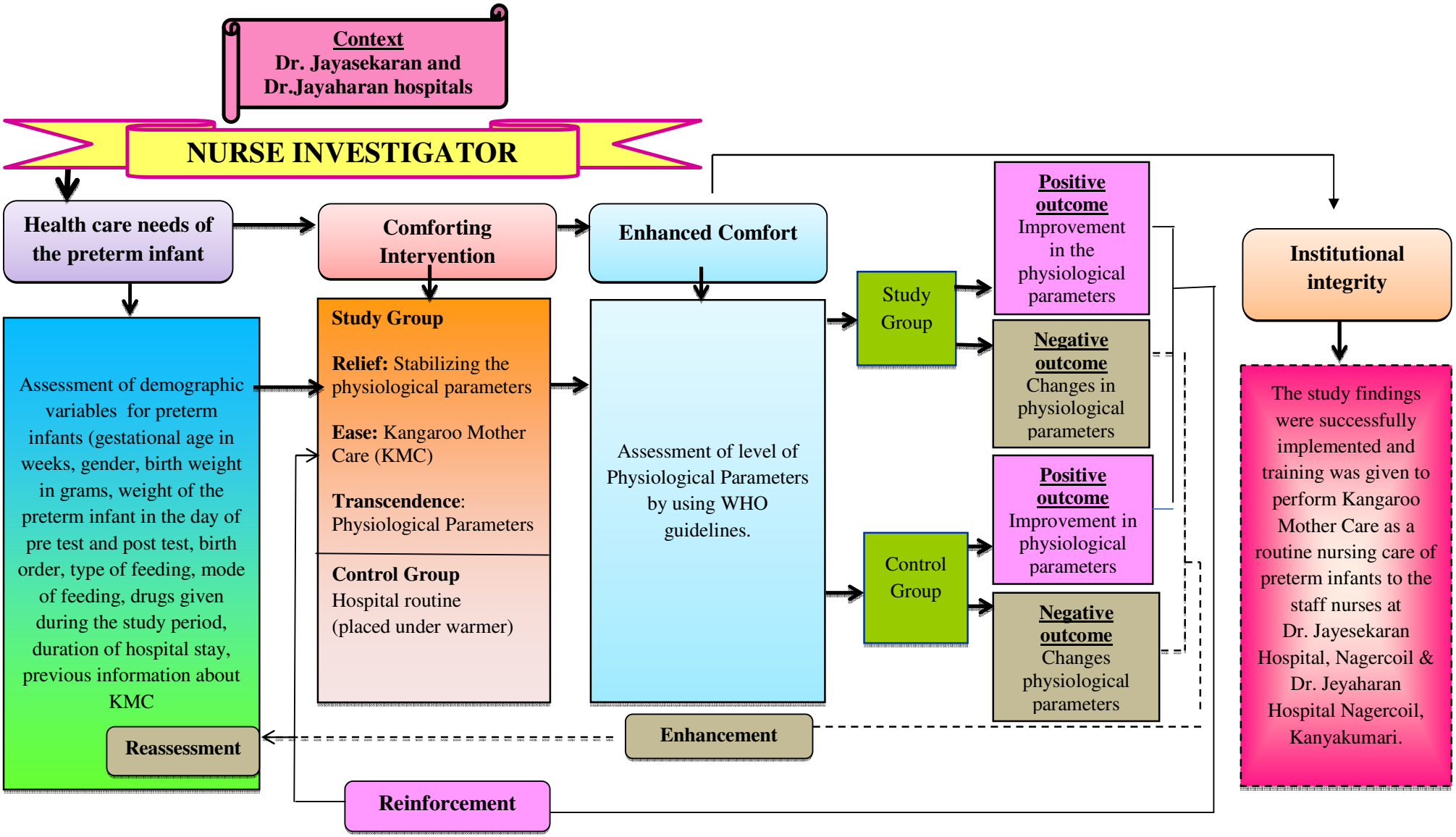

FIG.1.1: CONCEPTUAL FRAMEWORK BASED ON KOLCABA'S THEORY OF COMFORT, 2010

1.10 OUTLINE OF THE REPORT

Chapter 1: Deals with the background of the study, need for the study, statement of the problem, objectives, operational definitions, research hypothesis, assumptions, conceptual framework and delimitation of the study.

Chapter 2: Deals with review of literature.

Chapter 3: Presents the methodology of the study and plan for data analysis.

Chapter 4: Focuses on data analysis and data interpretation.

Chapter 5: Enumerates the discussion of the study

Chapter 6: Contains the summary, conclusions, implications, recommendations and limitations.

The study report ends with selected references and appendices.

CHAPTER – 2

REVIEW OF LITERATURE

REVIEW OF LITERATURE

Review of literature is a systematic search of a published work to gain information about a research topic (**Polit and Hungler, 2012**).

The literature review is a text of secondary sources, which describe current knowledge, and factual findings of theoretical and methodological contribution about the selected topic. Literature review based on surveys, scholarly articles, books, dissertations, journals and international nursing studies. The ultimate purpose of the review of literature is increasing the breadth of current knowledge, find out the evidences from various sources, and systematize scientifically within the framework.

In this study, the related literature undertaken by the investigator to expand the insight into the problem and gain information on that has done in the past. The investigator understands the concepts and sets a strong foundation for the study intervention tool and the conceptual framework framed based on Kolcoba‘s theory of comfort to the study.

This review of literature was done using the key words such as preterm infants, kangaroo mother care, skin to skin contact, physiological parameters, vital parameters, temperature, heart rate, respiration, oxygen saturation, weight, nutrition, variability of the parameters . These reviews were searched based on electronic and standard databases such as Cochrane library, Medical Literature Analysis and Retrieval System Online (MEDLINE), Cumulative Index to Nursing & Allied Health (CINAHL), Elton Bryson Stephens Company.(EBSCO), Pub Med, Google scholar, Excerpta Medica data BASE (EMBASE), British Nursing Index, Psychological Information (Psych. INFO) and other unpublished studies from dissertations. It includes Randomized Controlled Trials, systemic reviews and experimental studies. These reviews were taken from the year 2010 to 2015; which reflects the current research topic.

The aim of this review was to examine the literature on kangaroo mother care among preterm infants for 30 minutes and identify the level of physiological parameters.

ORGANIZATION OF LITERATURES

Section 2.1: Scientific reviews related to level of physiological parameters among preterm infants

Section 2.2: Scientific reviews related to effectiveness of Kangaroo Mother Care (KMC) on level of physiological parameters among preterm infants.

SECTION 2.1: SCIENTIFIC REVIEWS RELATED TO PHYSIOLOGICAL PARAMETERS OF THE PRETERM INFANTS.

Studies related to physiological parameters of the preterm infants.

Robin B knobel-dail, (2014) studied that hypothermia was a leading problem of the preterm infants in their first week of life. Minimizing the heat loss and thermal stability are very essential for the infants in their postnatal period of life. The recommended therapeutic interventions essential for preventing hypothermia and reduce the mortality and morbidity of the preterm infants.

Knobel Marsha L, Campbell-Yeo, Timothy C Disher, Britney L Benoit, Celeste Johnston C,(2012) contributed that the preterm infants up to 32 weeks of gestation not able to warm themselves because of thermogenin and monodeiodinase enzymes deficiency. Up to one-year age, the infants are using non-shivering thermo genesis mechanism. Charpak et al, (2010) found that 36.5°C temperature as a set temperature for the preterm infants in neonatal intensive care unit. The body temperature between 36.7 °C - 36.8 °C, the infants also maintains the normal heart rate.

World Health Organization (WHO),(2014) reported for the guidelines of thermal control and states the body temperature of the preterm infants, normal body temperature (36.5°C–37.5°C),mild hypothermia (36.4°C-35.2°C), moderate hypothermia (32°C–35.1°C), severe hypothermia(<32°C), hyperthermia(>37°C). Report shows above 36.5°C as a safest level of body temperature of the preterm infants.

Mc.Call et al, (2013) explored the prevention of heat loss among preterm infants and identified that to reduced heat loss by increasing the ambient temperature in the delivery room, using heated humidified gases, exothermic or thermal mattresses, heat loss barriers such as head coverings or plastic body coverings and promoting kangaroo care for the premature infants.

Indic, P, Salisbury E.B, Paydarfar D, Brown E.N, Barbieri R, (2010) contributed that the cardio respiratory function is a cardinal sign for the development of the infants. Preterm infant respiration has an effect on heart rate at the early developmental stage and analyzed the interaction between the cardio respiratory function and found the immaturity of the vital organs, the heart rate variation exist at the respiratory frequencies when there is no respiration. They recommended need further more studies in this aspect.

Many of the researchers analyzed the importance of sympathetic and parasympathetic components of the central nervous system and the management, interaction between the other parts of the body. Multiple researchers (Fabio Augusto Selig, Emanuele Renata Tonolli, Erico Vinicius Campos Moreira da Silva, Moacir Fernandes de, Godoy Faculdade de ,Medicina de, Sao Jose do Rio Preto, Sao Jose do Rio Preto, S.P, (2010) compared the heart rate variability of the preterm infants and term infants by using linear and non linear assessment technique. Study shows that, preterm infants have complex heart rate variability, suggested further more studies has to evaluate in the aspect of autonomic maturation of the preterm infants.

Robin et al, (2013) contributed that the physiological parameters of the preterm infants in NICU was difficult to maintain because of various factors that influenced the physiological parameters. Hypothermia was the main problem for preterm infants while in the NICU the preterm infants are exposed to various nursing care and procedures. Preterm infants are prone to exposed the cold environmental temperature. Preterm infants are having the impaired thermoregulatory process, because of nursing care and nursing procedures the preterm infants are exposing in to the cold environment temperature. Researchers identified in this problem in order to minimize nursing care with evidence-based practice of skin-to-skin contact are a method of care for the preterm infants in order to maintain the stable physiological parameters.

Lantz B, Ottosson C (2014) found that the four ways heat loss (radiation, conduction, convection and evaporation) occurs in the preterm infants during the postnatal period of life. The brown fat is act as insulator to prevent the loss of heat. However, the preterm infants are born with lack of brown fat. The physiological parameters of the preterm infants depend upon the gestational age, weight of the infants.

Variation in these parameters produced long term, short-term effects, which will determine the physiological, behavioral status of the preterm infants.

Thus, the research investigator viewed that the physiological parameters necessary to monitored for the preterm infants were temperature, heart rate, respiratory rate, oxygen saturation and weight in order improve their physiological and behavioral wellbeing.

Factors influencing physiological parameters of the preterm infants

Higgins (2014) found that the comforting measures such as Kangaroo Mother Care, mummification, nesting, swaddling was essential for the vulnerable preterm infants.

Brown G, (2010) analyzed that preterm infants in the NICU often exposed to auditory stimulation. Excessive auditory stimulation affects the physiological and behavioral stability of the preterm infants. Continuous with the excessive noise produced a negative responses in heart rate, apnea, blood pressure, oxygen saturation and recommends that covering the incubator with blankets, eliminate the noisy incubator equipments, encourage the calm and pleasurable environment, skin-to-skin maternal contact, educating the NICU staff. Bremmer.P, Byers J.F, Kiehl. E, (2011) modifying the NICU, effectively using of absorbent materials for the preterm infants in the NICU.

Slevin N, Farrington, Farrington, Duffy, Murphy J.F.A, (2007) contributes that the influencing factors in the NICU such as light, noise, staff activity and infant handling procedures. Promoting the pleasurable environment stimulates the stable responses in heart rate, blood pressure, oxygen saturation.

Bryanton et al, (2014) compared the effect of body temperature between the immersion bath and sponge bath, reports that the preterm infants in the sponge bath showed significantly reduction in the body temperature. Merentstein and Gardner, (2011); the physiological parameters are determined by gestational age, days of life, birth weight, skin maturity and underlying pathology.

Various researchers focused on factors affecting the preterm infants were noise, light, staff activity and procedures, which have a negative outcome of physiological parameters such as heart rate, blood pressure, oxygen saturation.

SECTION 2.2: SCIENTIFIC REVIEWS RELATED TO EFFECTIVENESS OF KANGAROO MOTHER CARE (KMC) ON LEVEL OF PHYSIOLOGICAL PARAMETERS AMONG PRETERM INFANTS.

Studies related to Kangaroo Mother Care:

Korraa AA, El Nagger AA, Mohamed RA, Helmy NM (2014) contributes that Kangaroo Mother Care impact on cerebral hemodynamic responses in stable preterm infants. Researchers found that there was a significant reduction in their Pulsatility index and Resistive index after 30-minutes of Kangaroo Mother Care. Hence, this study concluded Kangaroo Mother Care influenced the structure and promoting the development of the preterm infant's brain.

Series of Indian Researchers Chidambaram AG, Manjula S, Adhisivam B, Vishnu BB (2014); Akush Ginekol, Margret Sofia (2013) contributes that preterm infants are oftenly exposed to numerous repetitive painful procedures in the postnatal period. Kangaroo Mother Care is a simple non-pharmacological treatment, has a positive effect among the preterm infants to controlled, reduced the pain stimuli and its promoting comfort. Multiple researchers (Cong X, Cusson RM ,Zhang D, Kelly SP, Husain N, et al (2012) Ludington-Hoe SM, Walsh S (2012) reported that during the post natal period, preterm infants undergone for various invasive procedures (heel stick, intra venous canulation). Preterm infants between 26-32 weeks of gestational age and 4-27 postnatal days old was selected in this study, preterm infant's experienced decreased heart rate after application of 30 minutes of Kangaroo Mother Care than in incubator care. Researchers concluded Kangaroo Mother Care stabilized the autonomic, behavioral and physiological responses for the preterm and very low birth weight infants. Akcan E, Yigit R, Atici A (2010) extended their findings that preterm infants are 26-36 weeks of gestational age and 0-28 days post natal age in response of invasive painful procedures , premature infant pain profile was significantly decreased during and after the Kangaroo Mother Care (30 minutes of KMC before invasive procedure and 10 minutes after the procedure). De Sousa Freire NB, Garcia JBS, Lamy ZC (2010) explored that Kangaroo Mother Care was produced an analgesic effects on the preterm infants.

Yang Duan, Fu-qiang Sun, Yue-qin Li,Sheng-Shun Que et al (2015) reported that premature infants are have higher incidence of brain injuries and its impact on the mental and psychomotor development of preterm infants at the age of 12 and 24 month of their life. Bayley (2012) assessed the mental and the psychomotor development at 6, 12 and 24 month of life. Kangaroo Mother Care has an admirable long-term effect of mental and physical development of preterm infants. Researcher suggests Kangaroo Mother Care has to be included as a routine care.

Rafael Moura Miranda et al, (2014) Jose Eulalio Cabral filho et al, (2014) Vasconcelos DD, Souza Lima GM (2013) found that Kangaroo position (vertical position, lying face down, flexed limbs, undressed skin) provided sensorial, vestibular, postural stimulus of the preterm infants and its impact on the flexor tone , motor features and its gradually increasing the electromyographic activity of the biceps brachi muscles. Pro.Fernando Figueira, Recife-brazil (2011) identified that Surface Eletromyography (SEMG) helpful for scrutinizing the electromyographic activity of the preterm infants.

Conde-Agudelo A, Díaz-Rossello J.L, (2014) Belizan J.M., (2011) found that preterm infants have increased risk of mortality, hypothermia, nosocomical infections, diarrhea, readmission, increased hospital stays. In view of them, the mortality and morbidity rate of preterm infants is very high. The study concluded continues and intermittent Kangaroo Mother Care reduced the mortality, morbidity, infections, length of stay, improved mother infant bonding, breast feeding and also found that it was reduced the risk of neurosensory and neurodevelopment impairments of the preterm infants.

Maria A, Vivina A, Gloria G (2012) Preterm infants are vulnerable to infections due to their immaturity of the skin and mucosal barrier and immune system. Abouelfettoh A (2011); Ludington-Hoe S.M, Burant C, Visscher M, (2011) found that preterm infants 30-32 weeks of gestation compare the incubator and Kangaroo Mother Care (1.5 hours per day) improves the stratum corneum hydration and transepidermal water loss. Study shows that Kangaroo Mother Care has a positive effect on preterm infant's skin barrier function and hospital-acquired infection. Kangaroo Mother Care reduces the incidence of hospital-acquired infections (Conde-Agudelo 2011).

Flacking R., Lehtonen L, et al, (2012) Titus Fernandez et al, (2011) contributed that physical and emotional closeness of Kangaroo Mother Care (experiencing feelings of love, warmth and affection) in preterm infants has a positive effect on infant brain development, (Engler A.E, (2012) reduced the maternal and infant stress. Discenza D,(2011); Ahn J.Y, Lee J, Shinn,H,(2010) reduction of maternal post partum depression.

Indian researchers Gathwala, G., Singh, B., & Singh J, (2010) found that physical growth and breast feeding rate was statistically significant effects of Kangaroo Mother Care (6 hours per day for 7 days) on preterm infants have an increased in weight, length and occipital-frontal circumference.

Soukka H, Gronroos L, Leppasalo J, Lehtonen L, (2014) identified that Kangaroo Mother Care position (prone) it was an impact on the diaphragmatic electrical activity of the preterm infants after the episodes of respiratory distress syndrome. They found that after the 7 hours of Kangaroo Mother Care significantly lowering the diaphragmatic electrical activity and it has not associated with the neural activity. Thus, the above literatures show that the KMC has a positive effect on the preterm infants.

Many researchers viewed KMC as a simple, non-invasive, non-pharmacological measure to comfort the preterm infants as mothers provides sensorial, vestibular and nocturnal stimulus, which also improves the vital parameters of the preterm infants.

Other intervention related to physiological parameter of preterm infants:

Indian researchers Ramya Poulose, Molly Babu, Sharda Rastogi (2015) studied that the nesting of the preterm infants, flexed posture of the extremities and adduction of shoulders and increasing the movements of the arms , legs towards and across the midline of the preterm infants, reduced the movements and frozen postures of the preterm infants. The study concluded, the nesting was significantly effective in physiological parameters and reduced the discomfort of the preterm infants.

Indian researchers Sandeep Kaur Gill, Yogesh Kumar, Jyoti Sharin (2014) identified that preterm infants are having some physiological disabilities in their life, NICU has influence the sensory impact of the physiological, neurodevelopment and quality of the preterm infants. Researchers found that the comfort behaviour of the

preterm infants before and during nesting shows significant effects in physiological parameters of temperature, heart rate and comfort, and no significant effect in oxygen saturation.

Faranak Aliabadi, Reihaneh K. Askary (2013) reported that preterm infants between 1000-2000 grams are higher risk for major developmental disorders ,minor motor disorders and minor neurological dysfunction. Many studies reported that Tactile Kinesthetic Stimulation was beneficial effects on the growth of preterm infant's brain cells and improved the adaptive behaviour. Sheila Mathai, Armida Fernandez, Jayshree Mondkar and Wasundhara Kanbur (2013) synthesized the effect of Tactile Kinesthetic Stimulation for the preterm infants between 1000-2000 grams. Researchers found that statistically significant effect on the Brazelton Scale and improved the scores of orientation, range of state, regulation of state and autonomic stability. Researchers concluded that Tactile Kinesthetic Stimulation has a positive effect on growth and behavioral development and clinically significant effect on the physiologic parameters of the preterm infants.

Paul Patricia, Sao Paulo Jan, (2013) explored that the anatomical and psychological features of the preterm infants that impressed the systemic infirmity, as the immaturity of the respiratory and central nervous system. Therapeutic use of music and musical activity was effective for the pain, anxiety and stress. Ashley L Hodges, Lynda Law Wilson (2010); Ketz (2010) reported that premature infants in the NICU were benefit for auditory stimulation. The effects of music on the preterm infants in NICU, it has positive effects on the physiological parameters and behavioral stress responses, increased levels of quiet alert or quiet sleep states, improved parent interaction and improved weight gain of the preterm infants.

Segall (2010) evaluated that, the postnatal auditory stimulation of the preterm infants promoted the cardiac responses. When the preterm infant was crying the heart rate was decreased and quiet state the heart rate was increased in response to the auditory stimulation. Indian researcher Smith, J.V, (2012) explored the fact, preterm infants in the NICU expose to continuous noise which can interfere with the developmental process, an excessive auditory stimulation produce the negative physiological responses such as apnea, variation in heart rate ,blood pressure, oxygen saturation and more vulnerable to

hearing loss, abnormal sensory development, speech and language development. Hall and berry, (2011) the harmonic and rhythmic sound has effect on the pain, emotional and hemodynamic parameters. Study shows that there are no evidences found in temperature of the preterm infants. The drawback of the study was none of the researchers mentioned the decibel levels of the preterm infant. Kaminski (2012), 60-80 decibels can be providing for the preterm infants, but he did not report the scale measurement.

Freitas, P.D et al, (2014) documented that the hygienic measures of bath al so influence the physiological response of the preterm infants. Researchers compare the sponge bath and immersion bath. Study showed sponge bath was more effect on the reduction of temperature where as immersion bath maintained the stable body temperature. Swapna Gaddam (2016) identified that effectiveness of the swaddle bath and conventional bath on thermal stability among preterm infants. Researcher found that swaddle bath was effective in maintaining thermal stability compare to the conventional bath.

Chang, Y.J, Lin, C.P, Lin, Y.J, Linch (2011) contributes that the effectiveness of single hole and cross cut nipple on physiological parameters of the preterm infants. In this study revealed that using of single hole nipple, took more milk and less feeding time and stable physiological parameters compare to the crosscut nipples.

Kihara et al, (2013) revealed that prone position with nesting and swaddled position supported to the preterm infants for maintaining the physiological status, behavioral status and sleep distribution compared to the prone position. Pearson .A, Wiechula. R, Lockwood. C, (2010) found that premature infants are nursed in prone position are higher risk for postural abnormality, researcher found in this study ,a strong association between the prone sleep position and Sudden Infant Death Syndrome (SIDS). Researchers concluded prone sleep position not applicable for all preterm infants.

Peng N.H, Mao H.C, Chen Y.C, Chang YC, (2013) analyzed that the effect of light intensity on physiological parameters of the preterm infants, selected 35-37weeks of gestation and birth weight less than 2500 grams. Light intensity and the volume based on three techniques, coverage of blanket on the top of the incubator, coverage of blanket one third of the incubator, without blankets. Study shows that the intensity of the light

has a significant relationship between the physiological parameters of the preterm infants.

Thus, the researchers viewed that the various interventions such as nesting, position, light intensity, auditory stimulation, tactile kinesthetic stimulation, musical activity are used to comforting the preterm infants as well as the stabilizes physiological parameters, however it will produce a negative effects on the preterm infants. KMC is a motherly based care by providing comfort and improving the physiological parameters without any interruption.

Studies related to kangaroo mother care and physiological parameters:

Indian researchers Srinath, B.K, Shah, J, Kumar, P, Shah P.S,(2015) contributes that physiological and biochemical responses in stable preterm infants after one hour of Kangaroo Mother Care and Kangaroo Father Care. Researchers found that no significant changes in the physiological and biochemical responses identified in Kangaroo Mother Care, Kangaroo Father Care of preterm infants. Study concluded KMC was effective and KFC may safe for the preterm infants.

Multiple Indian researches (Bera, A, Ghosh, J et al, (2014) Singh, A.K, Hazra, A, Som T, Munian D,(2014) elegantly explored that effect of Kangaroo Mother Care on vital physiological parameters of the preterm infants between less than 2500 grams. Initially one hour followed by increased on the second and third day. Study findings showed that significantly improvement in the four physiological parameters (axillary temperature, heart rate, respiratory rate and oxygen saturation) of the preterm infants.

Boju ,S.L, Gopi Krishna, M, Uppala, R, Chodavarapu ,P, Chodavarapu ,R. (2012) analyzed the effectiveness of 4-6 hours Kangaroo Mother Care and one hour of Kangaroo Mother Care on level of physiological parameters among the preterm infants. Study showed that significant changes in the physiological parameters (increased in axillary temperature 0.4 F and oxygen saturation 1.1%,decreased in heart rate and respiratory rate 3 beats per minute), of one hour Kangaroo Mother Care of the preterm infants.

Feldman, R, Rosenthal, Z, Eidelman, A.I,(2014) reported that preterm birth drastically alter the brain development and associated with the maternal separation and disturbances in contact sensitive system of the preterm infants. Kangaroo Mother Care regulated the physiological, stress activity, autonomic function, sleep pattern, and supports the maturation of the prefrontal cortex of the brain and effects on the cognitive and behavior control of the preterm infants. Researchers found that 14 consecutive days of Kangaroo Mother Care analyzed at the age of 6 months and 10 years of life. Study concluded that Kangaroo Mother Care showed physiological organization and long-term effect on the preterm infants.

Indian researchers Pramila Verma,Vijay Verma,(2014) identified that the effects of 30 minutes for three consecutive days of Kangaroo Mother Care on heart rate, respiratory rate and temperature of the preterm infants and low birth weight babies. The study reported that Kangaroo Mother Care highly significant in maintaining skin temperature, heart rate and respiratory changes was insignificant. Almeida, C.M, Almeida, A.F.N, Forti, E.M.P (2013); Bras. Fisioter (2010) contributes that 30 minutes and three consecutive days of Kangaroo Mother Care, as a results significantly improvement in the body temperature, peripheral oxygen saturation, decreased in heart and respiratory rate of the preterm infants.

SUMMARY

The above literatures were selected to provide high quality of nursing care to the preterm infants with evidence based manner. Literatures also support that Kangaroo Mother Care was a cost effective, simple, practicable and non-pharmacological nursing interventions that helps to improve the physiological parameters of the preterm infants. During the search process, the investigator found the effects of KMC for 24 hrs, 12 hrs, 8 hours, 6 hrs, 4 hrs, 2nd hrs and one hour among preterm infants. Very few literature supports KMC can also be prescribed for 30 minutes for three days, which can also have the effects on the physiological parameters of the preterm infants.

CHAPTER – 3

RESEARCH METHODOLOGY

RESEARCH METHODOLOGY

The methodology is the systematic and theoretical analysis of any research study, which will empower the researcher to project a blue print of the research.

In this chapter describes the methodology assume in this study to assess the effectiveness of Kangaroo Mother Care on the level of physiological parameters among preterm infants at selected hospitals, Nagercoil. This phase of the study deals with the research design , variables, settings of the study, population, sample, inclusive and exclusive criteria for sample selection, sample size, sampling technique, development and description of the tool and plan for data analysis.

3.1 RESEARCH APPROACH

Quantitative Research Approach.

3.2 RESEARCH DESIGN

In this study the research investigator used as quasi –experimental non-equivalent control group, pre and post test research design. Quasi-experimental research design had a component of manipulation and absence of any one component of randomization and control group (Polit and Beck 2012). The quasi-experimental designs generally used to establish the causation (effect of independent variable on the dependent variable).

In this context, the research investigator manipulated the study group by assisting the mother to perform Kangaroo Mother Care, for 30 minutes, three consecutive days along with hospital routine. The investigator made control over the experimental circumstances by placing the preterm infants of control group in warmer only as a hospital routine. The investigator had endorsed pre and post-test, control group research design. Since the level of physiological parameters can be assessed before and after the Kangaroo Mother Care. The investigator conducted this study in different settings to prevent contamination and adopted control group in order to show the effectiveness of KMC. This made the investigator to undertake quasi-experimental design for this study.

The schematic representation of the quasi experimental study was as follows

	PRETEST (O_1) (before KMC)	**INTERVENTION (×)**	**POST TEST (O_2) (after three days of KMC)**
Study group	Assess the pre test level of physiological parameters among preterm infant by assessing the temperature, heart rate, respiratory rate, oxygen saturation and weight based on WHO guidelines.	The investigator assisted the mother to perform Kangaroo Mother Care along with hospital routine by placing the preterm infants between the mother's breast in a perpendicular position such that the head is turned to one side in slightly extended position, flex and abduct the arms and hip in a frog like position. Placing the preterm abdomen at the level of mother's epigastrium and support both the mother and preterm by autoclaved cotton sheet for 30 minutes for three consecutive days along with hospital routine. (Placing the preterm infant in warmer after the intervention of KMC procedure).	Assess the post test level of physiological parameters among preterm infant by assessing the temperature, heart rate respiratory rate, oxygen saturation and weight based on WHO guidelines.
Control group		The preterm infant under goes as per hospital routine (placed under warmer only)	

3.3 VARIABLES

3.3.1 Independent variable

The independent variable of the study was Kangaroo Mother Care.

3.3.2 Dependent variable

The dependent variable of the study was level of physiological parameters among preterm infants.

3.3.3 Extraneous variables

It consist of demographic variable for preterm infants which includes gestational age in weeks, gender, birth weight in grams, weight of the preterm infant in the day of pretest, birth order, type of feeding, mode of feeding, drugs given during the study period, duration of hospital stay.

The demographic variables for mothers which includes age of the mother, education level of the mother, occupation of the mother, parity of the mother, position of the mother during KMC, communication of the mother with preterm during KMC ,frequency of feeding per day, previous information about KMC.

3.4 SETTING OF THE STUDY

The study was conducted in Dr.Jayasekaran Memorial Hospital, Nagercoil. It is a private with 200 bedded multispecialty hospitals with three levels of 20-bedded NICU with 6-8 preterm infants admitted per week and in Dr.Jayaharan Hospital, Nagercoil, which was a 200-bedded hospital with 18 beds in NICU with 7-10 preterm infants admitted per week. The samples for study and control group was selected from both the settings equally.

3.5 POPULATION

3.5.1 Target population

Preterm infant born between 26-36 weeks of gestation, weighing >1500gms

3.5.2 Accessible population

Preterm infant born between 26-36 weeks of gestation, weighing >1500 grams admitted in preterm unit at Dr.Jayasekaran Memorial Hospital Nagercoil and Dr.Jayaharan Hospital Nagercoil, Kanyakumari.

3.6. SAMPLE

Preterm infants born between 26 to 36 weeks of gestation weighing > 1500 grams who fulfils the inclusive criteria was selected at Dr.Jayasekaran Memorial Hospital and Dr.Jayaharan Hospital Nagercoil was selected (both study and control group) as the samples.

3.7 SAMPLE SIZE

The Sample size consisted of minimum 60 preterm infants (30 samples in study & 30 samples in control group) who fulfilled the inclusive criteria and exclusive criteria.

3.8 SAMPLING TECHNIQUE

Sampling technique designated for the study was Non-probability purposive sampling technique to allocate the samples in study and control group. In this study, the investigator purposefully studied the effectiveness of Kangaroo Mother Care on level of physiological parameters among preterm infants, therefore, non- probability purposive sampling technique was used.

3.9 CRITERIA FOR SAMPLE SELECTION

3.9.1 Inclusive criteria

1. Preterm infant with gestational age of 26-36 weeks.
2. Preterm infant whose birth weight >1500grams and admitted in NICU at Dr.Jayasekaren Dr. Jayaharan Hospitals, Nagercoil.
3. Preterm infant those who are hemodynamically stable.

3.9.2 Exclusive Criteria

1. Preterm infants whose mothers are affected with contagious disease.
2. Mother of preterm infants who are not willing to provide Kangaroo Mother Care.

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3.10 DEVELOPMENTAL AND DESCRIPTION OF TOOL

After an extensive review of literature, discussion with experts in the field of Paediatrics, the investigator's personal and professional experiences, the WHO guidelines for physiological parameters such as temperature, heart rate, respiratory rate, oxygen saturation, weight were adapted as the tool for the study.

The tool constructed in this study has divided into two parts.

3.10 Data collection tool: This consisted of two sections

Section A: Assessment of Demographic Variables.

Section B: Assessment of Physiological parameters based on WHO guidelines.

3.10.1 Intervention tool: Kangaroo Mother Care

3.10.1 DATA COLLECTION TOOL

PART- A

Section A: **Assessment of Demographic Variables**

Structured interview schedule and medical record were reviewed to assess the demographic data. It consists of demographic variables for preterm infant which includes gestational age in weeks, gender, birth weight in grams, weight of the preterm infant in the day of pretest, birth order, type of feeding, mode of feeding, drugs given during the study period, duration of hospital stay and the demographic variables for mothers includes age of the mother in years, education level of the mother, occupation of the mother, parity of the mother, position of the mother during KMC, communication of the mother with preterm during KMC, frequency of feeding per day, previous information about KMC.

Section B: Physiological parameter WHO guidelines for to assess the level of physiological parameters of preterm infants. Source: (Thermal control of the Preterm's, a practical guide.)

Parameters	Inference	Range
Temperature(^{0}c)	Hyperthermia	>37.5
	Normal	36.5-37.5
	Mild hypothermia	36.4-35.2
	Moderate hypothermia	32-35.1
	Severe hypothermia	<32
Heart Rate(beats/min)	Tachycardia	>170
	Normal	120-170
	Bradycardia	<120

Parameters	Inference	Range
Respiratory rate (breaths/min)	Tachypnoea	>70
	Normal	40-70
	Bradypnoea	<40
Oxygen saturation (%)	Normal	92-94
	Mild desaturation	90-91
	Moderate desaturation	88-89
	severe desaturation	<88
Weight (g/kg/day)	Normal	> 15
	Mild under weight	14-10
	Moderate under weight	9-5
	Severe under weight	<4

3.10.2 INTERVENTION TOOL

Kangaroo Mother Care is an standard method of care for the preterm infants, where the preterm infants is placed in an flexed position against the mother chest with early skin to skin contact between the mother and preterm infants. Kangaroo Mother Care nurture the health and well-being of the preterm's by promoting effective thermal control, breast-feeding and sensory stimulation, infection prevention and mother –child bonding and reducing hospital stays.

Preliminary preparation

- The investigator established rapport with the mother.
- The investigator explained and demonstrated the procedure, importance and the benefits of Kangaroo Mother Care (KMC) in order to create awareness and alleviate the fear and anxiety through power point presentation for 10-20 minutes.
- The investigator obtained the informed written consent and assessed the demographic variables from the mother and the medical records.

Preparation of the articles

Articles	Numbers	Rationale
A clean tray containing:		
Omron Digital thermometer	1	➢ To check the temperature of the preterm infants before and after KMC
Calibrated Portable pulse oxymeter	1	➢ To check the oxygen saturation and heart rate of the preterm infants before and after KMC
Cotton balls in a container	2	➢ To wipe the axilla and digital thermometer.
Calibrated Infant weighing scale	1	➢ To check weight of the preterm infant before and after KMC
Kidney tray	1	➢ To collect the waste
Autoclaved cotton sheet	1	➢ To wrap and support the mother and the baby

Preparation of the environment

- The investigator arranged all the necessary articles, switched off the fan, maintained privacy and the room temperature.

Preparation of the investigator

- The investigator arranged all the necessary articles at bedside, performed hand hygiene, wore cap, mask and apron.
- The investigator checked the preterm infant's physiological parameters such as temperature, heart rate, respiration, oxygen saturation, weight and records immediately.

Preparation of the mother

- The investigator asked the mother to perform maternal hygiene such as bath/sponge, change of clothes, hand washing, and cut short the fingernails.
- The investigator asked the mother to wore front-open light dress as per the local culture.
- The investigator assisted the mother in a comfortable sitting position.

Preparation of the preterm infant.

The investigator undressed the preterm infant and the preterm infants worn only diaper during the KMC.

During the procedure

- The investigator performed hand hygiene and placed the preterm infant between the mother's breasts in a perpendicular position such that head turn to one side in slightly extended position, flexed and abducted the arms and hip in a frog like position. The investigator placed the preterm abdomen at the level of mother's epigastrium, asked the mother to hold the preterm infants and then the investigator supported both the mother and the preterm infant by autoclaved cotton sheet for 30 minutes for three consecutive days.

After the procedure

- The investigator placed the preterm in a comfortable position. The investigator checked and documented the physiological parameters immediately after the procedure for three consecutive days. Preterm infants allowed performing their routine activities.

3.11 CONTENT VALIDITY

The content validity of the scale ascertained from the following field of expertise

Neonatologist	-1
Paediatric consultant	-2
Paediatric Nursing Specialist	- 2

All the five experts had given their consensus, the additions and suggestions given by the experts were incorporated in the tool, and the tool was finalized

3.12 ETHICAL CONSIDERATIONS

The institutional ethical review board of International Centre for Collaborative Research (ICCR), of Omayal Achi College of Nursing, approved the study and ethical principles followed in the study were

(A) BENEFICENCE

- **Freedom from harm and discomfort**

The study participants prevented from unnecessary risk of harm and discomfort during the study period. The mothers of the preterm infants gave full freedom to disclose their view of discomfort that they felt during the course of the study.

- **The right to protection from exploitation**

Mothers of the preterm infant assured that participation of their preterm infant or information provided by them would not be used against them. The investigator completely explained the procedure. The investigator explained the procedure and nature of the study and ensured that the samples in both the study and control group were not be exploited in any cost, or denied from fair treatment.

(B) RESPECT FOR HUMAN DIGNITY

The investigator followed the second ethical principle of respect for human dignity. It includes the right to self-determination and right to self-disclosure.

- **The right to self determination**

The investigator had provided full freedom to the mothers of the preterm infants to decide voluntarily about the participation of their preterm infants in the study and the right to ask any question during the course of the study.

- **The right to full disclosure**

The investigator had fully described the nature of the study; the mother's right to refuse participation and written informed consent were obtained from the parents.

(C) JUSTICE

The investigator adhered to the third ethical principle of justice. It includes samples right to fair treatment and right to privacy

- **The right to fair treatment**

The investigator selected the study samples based on the inclusion and exclusion criteria and divided them into study and control group. Both the groups were given equal

consideration with regard to safety, privacy, and aseptic technique throughout the study period.

- **The right to privacy**

The investigator maintained the study samples privacy through confidentiality pledge obtained through written consent from the mothers of the preterm infants.

(D) CONFIDENTIALITY

The investigator maintained confidentiality of the data provided by the study participants through individual coding for each participant.

3.13 RELIABILITY

The reliability of the tool was interpreted by inter- rater method. The investigator was selected 10 preterm infants and allocated into study and control group. The investigator assessed the tool with the equally efficient M.Sc.(N)staff, at Dr. Jayasekaran hospital, for all 10 samples. The reliability obtained was 0.8. The 'r' value indicated positive correlation, which showed that the tool was reliable for the investigator to conduct the main study.

3.14 PILOT STUDY

Pilot study is a trial run for the main study. The refined tool was used for pilot study to test the feasibility and practicability.

Data collection procedure was done in Dr. Jeyasekaran Memorial Hospital, Nagercoil after getting Formal administrative approval was obtained from the International Collaborative Centre for Research (ICCR), Principal, Omayal Achi College of Nursing, and from the Medical Directors, Paediatricians Neonatologist, Nursing administrator of Dr. Jeyasekaran Memorial Hospital, Nagercoil. A brief introduction about self and purpose of study was explained to parents and written informed consent was obtained from them. Confidentiality regarding the data was assured to get cooperation throughout the procedure of data collection period.

The investigator had selected 10 samples of preterm infants (26-36 weeks of gestation) who fulfilled the inclusive criteria; through Non-probability purposive sampling technique and thus had divided them into study group and control group.

After selecting the samples, the reliability of the tool was checked through inter rater method, with the aid of M.sc nursing staff of NICU for the 10 samples, by assessed the physiological parameters and thus the score was obtained for each samples as a pre test score, which was followed by the intervention of Kangaroo Mother Care (KMC) for given by the investigator to the study group for a period of 30 minutes for three consecutive days. The intervention was given for 3 days after which again the physiological parameters was assessed for both study and control group.

During the intervention, the investigator maintained thorough sterility and daily time - schedule of intervention maintained for each sample i.e. The pre test physiological parameters score, intervention performed and the post test physiological parameters score with the date and specified time recorded.

There was no attrition experienced during the study and effectiveness of the intervention was witnessed by the investigator and recorded.

3.15 PROCEDURE FOR DATA COLLECTION

Data collection procedures was done in Dr.Jayasekaran Memorial hospital and Dr.Jayaharan Hospital, Nagercoil. Formal administrative approval was obtained from the International Centre for Collaborative Research (ICCR), Principal, Omayal Achi College of Nursing, approval from the Administrators, Medical director, Neonatologist of NICU, Nursing Supervisor of Dr.Jayasekaran Memorial hospital and Dr.Jayaharan Hospital, Nagercoil, was obtained by the investigator prior to the study.

The investigator gave a brief introduction about self and purposes of study were explained to the mother of preterm infants about the benefit of the selected cost-effective nursing measure. The investigator, NICU doctors and nursing supervisors, gave clear explanations of the intervention. Confidentiality regarding the data was assured to get cooperation throughout the procedure of data collection period.

The data collection was done for a period of four weeks and the investigator worked from morning 7.30 am to 10 am in the morning at Dr.Jayaharan Hospital and 10.30 am to 1 pm in the morning at Dr.Jayasekaran Memorial Hospital, for completion

of the scheduled intervention. Based on the inclusion and exclusion criteria samples for the study were selected depending on the number of admissions on daily basis.

The investigator assigned the samples into study and control group based on the availability of clinically stable preterm infants each day. Pair matching was done for the gestational age in weeks, weight of the preterm infants, duration of the hospital stay, age of the mother and occupation of the mother.

The investigator performed the intervention for those selected preterm infants. The demographic variables were assessed from the medical records and checked the physiological parameters of the preterm infants such as temperature by using Omron digital thermometer, heart rate, oxygen saturation by using calibrated pulse oxymeter, calibrated weigh scale by using infant weighing scale based on the WHO guidelines prior to the intervention.

The investigator-established rapport with the mother, explained, demonstrated the procedure, importance and the benefits of Kangaroo Mother Care in order to create awareness and alleviate the fear and anxiety through power point presentation for 10-20 minutes. The investigator obtained the informed written consent from the preterm infant's mothers. The investigator asked the mother to perform maternal hygiene such as daily bath, change of clothes, hand washing, and cut short the fingernails. The investigator asked the preterm infant's mother to wore front open light dress as per the local culture. The investigator assisted the mother to perform Kangaroo Mother Care in a comfortable sitting position. The investigator arranged all the necessary articles, switch off the fan, maintained privacy, and maintained the room temperature.

The investigator assisted the mother to perform Kangaroo Mother Care with the preterm infants for 30 minutes. The investigator placed the preterm infant between the mother's breast in a perpendicular position such the head turn to one side in slightly extended position, flexed and abducted the arms and hip in a frog like position. Placed the preterm abdomen at the level of mother's epigastrium and supported both the mother and the preterm by autoclaved cotton sheet for 30 minutes for three consecutive days. The investigator placed the preterm in a comfortable position. The investigator checked

and documented the physiological parameters after the procedure for three consecutive days. Preterm infants are allowed to perform their routine activities.

3.16 PROCEDURE FOR DATA ANALYSIS

The data collected were analyzed using both descriptive and inferential statistics

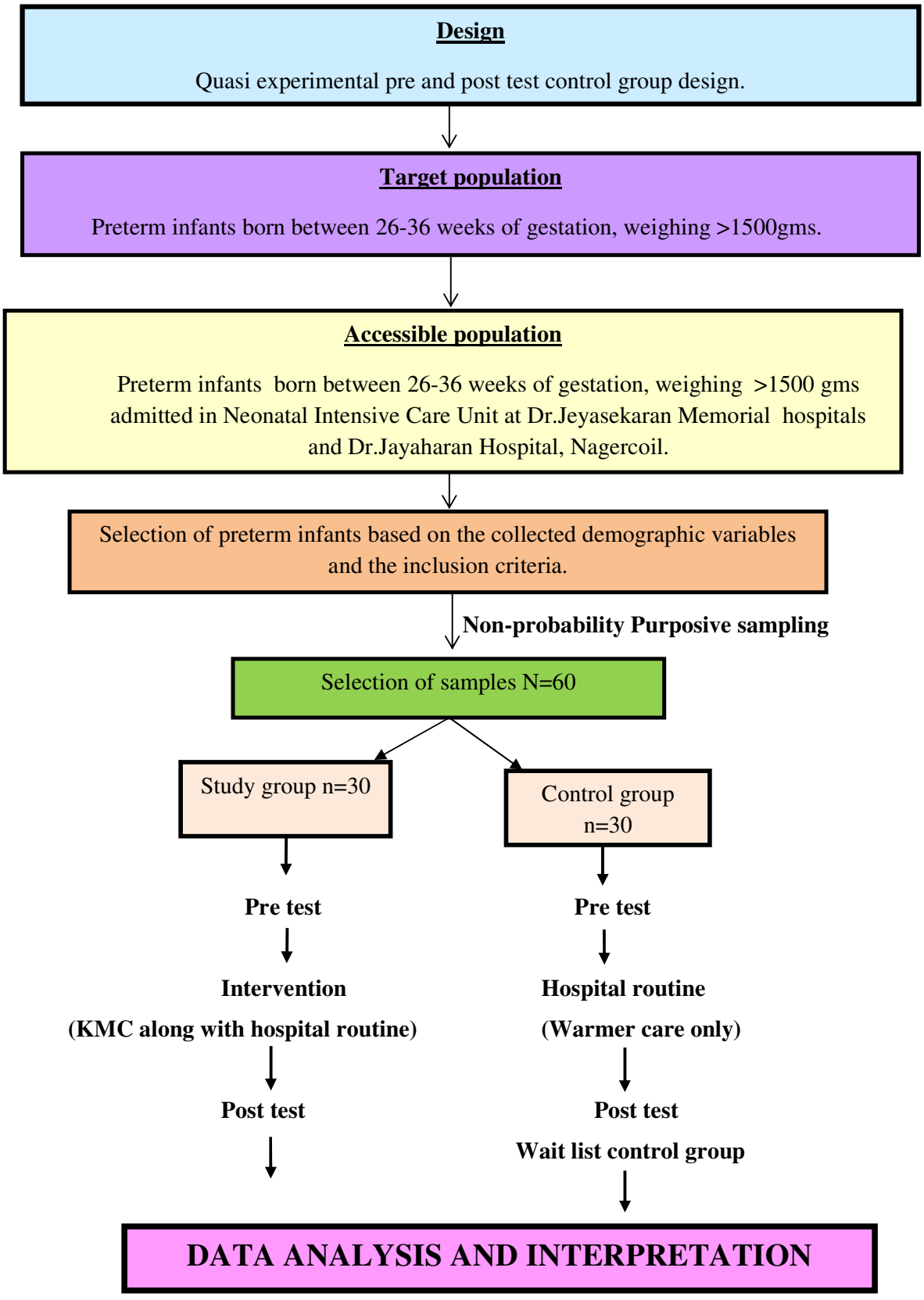
3.16.1 Descriptive Statistics

1. Frequency and percentage distribution was used to analyze the demographic data of preterm infant undergoing Kangaroo Mother Care.
2. Mean and standard deviation was used to assess the level of physiological parameters among preterm infant undergoing Kangaroo Mother Care.

3.16.2 Inferential Statistics

1. Paired “t” test was used to compare the data within the study and the control group.
2. Unpaired “t” test was used to compare the data between the study and the control group.
3. Chi-square and one way ANOVA was used to associate the selected demographic variables with the mean differed score of physiological parameters among preterm infants in study and control group.

SCHEMATIC REPRESENTATION OF RESEARCH METHODOLOGY



CHAPTER – 4

DATA ANALYSIS AND INTERPRETATION

DATA ANALYSIS AND INTERPRETATION

This chapter deals with analysis and interpretation of the data collected from 60 preterm infants (30 in study and 30 in control group) to study the effectiveness of kangaroo mother care on level of physiological parameters among preterm infants at selected hospitals, Nagercoil. The data collected was organized, tabulated and analyzed according to the objectives. The findings based on the descriptive and inferential statistical analysis presented under the following sections.

ORGANIZATION OF THE DATA

Section 4.1: Description of the demographic variables of the preterm infants in the study and the control group.

Section 4.2: Assessment and comparison of pre test and post test level of physiological parameters among preterm infants in study and control group.

Section 4.3: Assessment and comparison of pre test and post test level of physiological parameters among preterm infants between the study and control group.

Section 4.4: Association of the selected demographic variables with the mean differed score of physiological parameters among preterm infants in study and control group.

SECTION 4.1: DESCRIPTION OF DEMOGRAPHIC VARIABLES OF THE PRETERM INFANTS IN THE STUDY AND CONTROL GROUP.

Table 4.1.1: Frequency and Percentage distribution of demographic variables of preterm infants in study and control group with respect to gestational age, gender, weight of the preterm and birth order.

N =60

S. No.	Demographic variables	Study Group n=30		Control Group n=30		Chi-square value
		No.	%	No.	%	
1.	**Gestational age in weeks (Pair matched)**					
	26-28	-	-	-	-	χ^2 = 0.270
	29-31	1	3.3	1	3.3	p = 1.000
	32-34	11	36.7	11	36.7	N.S
	35-36	**18**	**60.0**	**18**	**60.0**	
2.	**Gender**					χ^2 = 0.606
	Male	**16**	**53.3**	13	43.3	p = 0.616
	Female	14	46.7	**17**	**56.7**	N.S
3.	**Weight of the preterm infant in grams (Pair matched)**					χ^2 =0.000
	1500-2000	10	33.3	10	33.3	p = 1.000
	2001-2500	**20**	**66.7**	**20**	**66.7**	N.S
	>2500	-	-			
4.	**Birth order**					
	1st	**12**	**40.0**	**14**	**46.7**	χ^2 =0.288
	2nd	**12**	**40.0**	11	36.7	
	3rd	6	20.0	5	16.7	p = 0.890
	4th	-	-	-	-	N.S

The above table 4.1.1 shows that majority of the preterm infants were in the gestational age of 35-36 weeks in both groups, and most of the preterm infant were males in study group, females in control group with birth weight of 2001-2500 grams in both the groups and the birth order was 1st & 2nd in the study group, and 1st in control group.

Table 4.1.2: Frequency and Percentage distribution of demographic variables of preterm infants in study and control group with respect to type of feeding, mode of feeding, drugs given during the study period and duration of hospital stay.

N=60

S. No.	Demographic variables	Study Group n=30		Control Group n=30		Chi-square value
		No.	%	No.	%	
1.	**Type of feeding**					Nil
	direct breast feeding	-	-	-	-	
	formula feeding	-	-	-	-	
	combination of 1 and 2	30	100.0	30	100.0	
2.	**Mode of feeding**					Nil
	Paladai	-	-	-	-	
	Naso gastric tube feeding	-	-	-	-	
	Direct breast feeding	-	-	-	-	
	Combination of 1 and 3	30	100.0	30	100.0	
3.	**Drugs given during the study period**					χ^2 = 0.628 p = 0.807 N.S
	Cefotaxim, Amikacin	**22**	**73.3**	**24**	**80.0**	
	Piptaz, Amikacin	6	20.0	5	16.7	
	Vancomycin, Amikacin	2	6.7	1	3.3	
4.	**Duration of hospital stay(pair matched)**					χ^2 = 0.156 p = 1.000 N.S
	1-3 days	**19**	**63.3**	**19**	**63.3**	
	4-6 days	9	30.0	9	30.0	
	more than 6 days	2	6.7	2	6.7	

The above table 4.1.2 states that all the preterm infants received combination of both direct breast-feeding and formula feeding through direct breast and paladai respectively. Majority of the preterm infants received drugs such as Cefotaxime and Amikacin with the duration of 1-3 days of hospital stay in both the study and the control group.

Table 4.1.3: Frequency and Percentage distribution of demographic variables of preterm infants mothers in study and control group with respect to age of the mother, education level, occupation and parity of the mother.

N =60

S.No.	Demographic variables	Study Group n=30		Control Group n=30		Chi-square Value
		No.	%	No.	%	
1.	**Age of the mother in years (Pair matched)**					χ^2 = 0.091 p = 1.000 N.S
	20-25	5	16.7	5	16.7	
	26-30	**18**	**60.0**	**18**	**60.0**	
	31-35	7	23.3	7	23.3	
	above 35	-	-	-	-	
2.	**Education level of the mother**					χ^2 = 0.801 p = 1.000 N.S
	Primary school	1	3.3	2	6.7	
	Secondary school	4	13.3	4	13.3	
	Higher secondary school	10	33.3	9	30.0	
	Undergraduate	**11**	**36.7**	**12**	**40.0**	
	Post graduate	4	13.3	3	10.0	
3.	**Occupation of the mother (Pair matched)**					χ^2 = 0.00 p = 1.000 N.S
	Employed	7	23.3	7	23.3	
	Un employed	**23**	**76.7**	**23**	**76.7**	
4.	**Parity of the mother during KMC**					χ^2 = 0.272 p = 0.795 N.S
	Primi gravid	12	40.0	14	46.7	
	Multi gravid	**18**	**60.0**	**16**	**53.3**	

The above table 4.1.3 shows that the majority of the preterm infants mothers were in the age of 26-30 years predominantly under graduate, unemployed and multi gravida in both the study and control group.

Table 4.1.4: Frequency and Percentage distribution of demographic variables of preterm infants mothers in study and control group with respect to position of the mother, communication of the mother and frequency of feeding per day.

N=60

S. No.	Demographic variables	Study Group n=30		Control Group n=30		Chi-square Value
		No.	%	No.	%	
1.	**Position of the mother during KMC**			N.A	N.A	Nil
	Sitting position	30	100.0	-	-	
	Lying down position	-	-	-	-	
2.	**Communication of the mother with preterm during KMC**			N.A	N.A	Nil
	Yes	**25**	**83.3**	-	-	
	No	5	16.7	-	-	
3.	**Frequency of feeding per day**					$\chi^2 = 3.801$ p = 0.173 N.S
	6-7 times	**11**	**36.7**	6	20.0	
	8-10 times	8	26.7	**15**	**50.0**	
	11-12 times	**11**	**36.7**	9	30.0	
	Mmore than 12 times	-	-	-	-	

The above table 4.1.4 shows that all the preterm infant's mothers in the study group were resumed in sitting position and majority of the mother communicated with the preterm infant and infants were fed for 6-7, 11-12 times in study group and 8-10 times in control group.

Chi square test revealed that the groups, i.e., study group had maintained homogeneity with respect to demographic variables such as gestational age in weeks, weight of the preterm infants in grams, duration of hospital stay, age of the mother, occupation of the mother throughout the study period with control group.

SECTION 4.2: ASSESSMENT AND COMPARISON OF PRE AND POST TEST LEVEL OF PHYSIOLOGICAL PARAMETERS AMONG PRETERM INFANTS WITH IN THE STUDY AND CONTROL GROUP.

Table 4.2.1: Assessment and comparison of pre and post test level of physiological parameters among preterm infants within the study group

n=30

Group	Mean	Std. Deviation	Mean Difference	Paired 't' test score	
				T	Sig.
Pre Temperature (Celsius)	35.45	0.79	-1.31	**-9.92**	**.000*** **
Post Temperature (Celsius)	36.76	0.18			
Pre Heart rate (beats/min)	117.80	2.64	-11.66	**-21.82**	**.000*** **
Post Heart rate (beats/min)	129.47	3.84			
Pre Respiration (breaths/min)	37.20	2.14	-8.53	**-14.64**	**.000*** **
Post Respiration (breaths/min)	45.73	2.55			
Pre Oxygen Saturation (%)	89.57	1.00	-4.10	**-23.40**	**.000*** **
Post Oxygen Saturation(%)	93.67	1.47			
Pre Weight (grams)	2106.33	267.25	-32.76	**-108.48**	**.000*** **
Post Weight (grams)	2139.10	267.89			

df – degrees of freedom, sig. – Level of statistical significance, ***- significance at p<0.001

The above Table 4.2.1 presents that the assessment and comparison of pre and post test level of physiological parameters within the study group with paired 't' test and inferred that there was high level significant differences pertaining to temperature ,heart rate, respiratory rate ,oxygen saturation and weight at p<0.001. The table depicts that KMC along with hospital routine (warmer care) was highly significant in improving the physiological parameters of the preterm infants.

Table 4.2.2: Assessment and comparison of pre and post test level of physiological parameters among preterm infants within the control group

n=30

Group	Mean	Std. Deviation	Mean Difference	Paired 't' test score	
				T	Sig.
Pre Temperature (Celsius)	35.46	0.50	-0.376	**-8.74**	**.000*** **
Post Temperature (Celsius)	35.83	0.41			
Pre Heart rate (beats/min)	117.17	2.32	-2.33	**-7.00**	**.000*** **
Post Heart rate (beats/min)	119.50	1.25			
Pre Respiration (breaths/min)	34.93	2.27	-2.53	**-9.37**	**.000*** **
Post Respiration (breaths/min)	37.47	1.65			
Pre Oxygen Saturation (%)	89.60	0.93	-1.43	**-13.81**	**.000*** **
Post Oxygen Saturation (%)	91.03	0.80			
Pre Weight (grams)	2136.33	240.65	-15.20	**-4.54**	**.000*** **
Post Weight (grams)	2151.53	242.79			

df – degrees of freedom, sig. – Level of statistical significance, ***- significance at p<0.001

The above table 4.2.2 shows that the assessment and comparison of pre and post test level of physiological parameters within the control group with paired 't' test and inferred that high level significant differences pertaining to temperature, heart rate, respiratory rate, oxygen saturation and weight at p<0.001. Preterm infants in the control group underwent the hospital routine (warmer) also had improvement in their physiological parameters.

SECTION 4.3: ASSESSMENT AND COMPARISON OF PRE AND POST TEST LEVEL OF PHYSIOLOGICAL PARAMETERS AMONG PRETERM INFANTS BETWEEN THE STUDY AND CONTROL GROUP.

Table 4.3.1: Assessment and comparison of pre and post test level of physiological parameters among preterm infants between study and control group

(N = 60)

	Group	Mean	Std. Deviation	Mean Difference	Unpaired 't' test score	
					t	Sig.
Pre Temperature (Celsius)	Study	35.45	0.79	-0.006	-0.039	.969
	Control	35.46	0.50			
Pre Heart rate (beats/min)	Study	117.80	2.64	0.63	0.98	.328
	Control	117.17	2.32			
Pre Respiration (breaths/min)	Study	37.20	2.14	2.27	**3.97**	**.000*** **
	Control	34.93	2.27			
Pre Oxygen Saturation (%)	Study	89.57	1.00	-0.033	-0.13	.895
	Control	89.60	0.93			
Pre Weight (grams)	Study	2106.33	267.25	-30.00	-0.45	.649
	Control	2136.33	240.65			
Post Temperature (Celsius)	Study	36.76	0.18	0.93	**11.29**	**.000*** **
	Control	35.83	0.41			
Post Heart rate (beats/min)	Study	129.47	3.84	9.96	**13.48**	**.000*** **
	Control	119.50	1.25			
Post Respiration (breaths/min)	Study	45.73	2.55	8.26	**14.85**	**.000*** **
	Control	37.47	1.65			
Post Oxygen Saturation (%)	Study	93.67	1.47	2.63	**8.59**	**.000*** **
	Control	91.03	0.80			
Post Weight (grams)	Study	2139.10	267.89	-12.43	-0.18	.851
	Control	2151.53	242.79			

df – degrees of freedom, sig. – Level of statistical significance, ***- significance at p<0.001, *- Significance at p<0.05.

The above table 4.3.1 shows that the assessment and comparison of pre and post test level of physiological parameters between the study and control group with independent t test and inferred that high level significant differences pertaining to temperature ,heart rate, respiratory rate, oxygen saturation at p<0.001. The above table also depicts preterm infants those who have underwent the nursing intervention of KMC along with hospital routine significant improvement in the physiological parameters comparing to the preterm infants underwent the hospital routine only (placed under warmer).

N=60

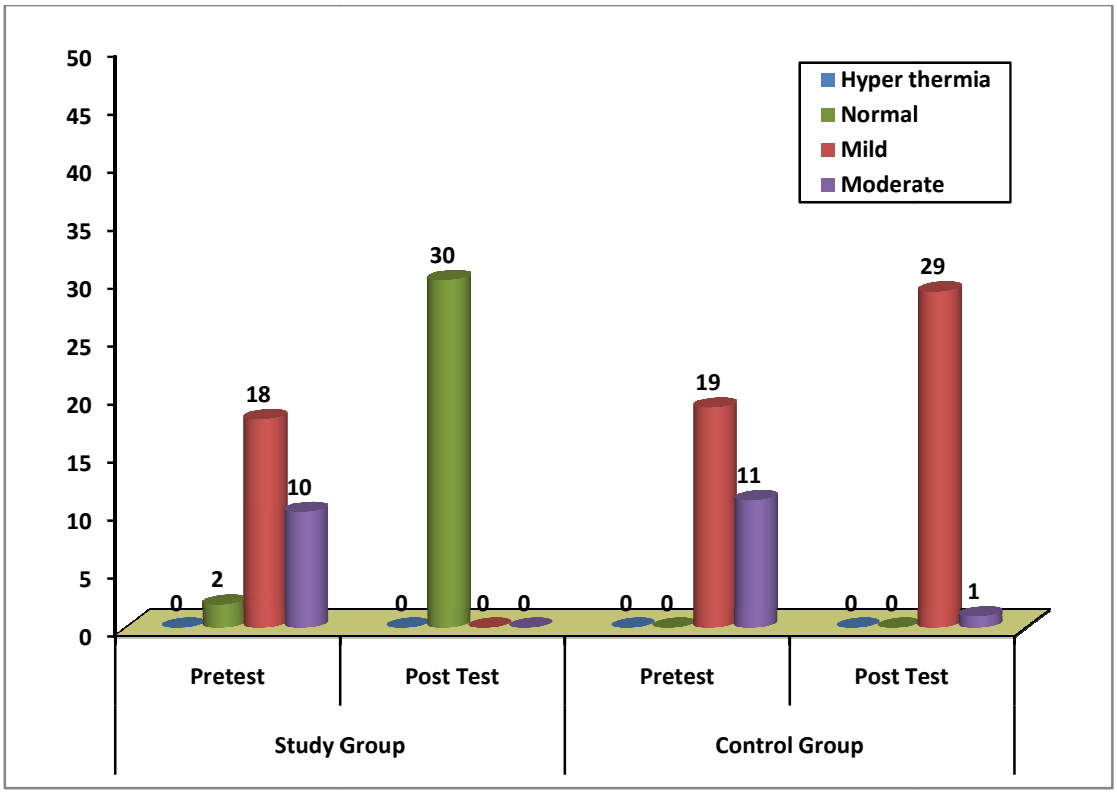


Figure 4.3.2: Comparison of pre and posttest level of temperature among pre term infants between the study and control group

The above figure 4.3.2 shows that none of the preterm infant experienced hyperthermia in both study and control group. In the study group majority of the preterm infants experienced mild hypothermia, some of the preterm infants experienced moderate hypothermia and few infants are having normal temperature in the pretest however all the preterm infants are maintained normal body temperature in the posttest. Whereas in control group the majority of the preterm infants experienced mild hypothermia and some of the preterm infants experienced moderate hypothermia in the pretest however, most of the preterm infants experienced mild hypothermia and very few infants are having moderate hypothermia after the hospital routine only (warmer) This depicts that the Kangaroo Mother Care effectively improved the body temperature of the preterm infants. Hence, the investigator reinforced the intervention of preterm infants to follow KMC for 30 minutes along with hospital routine.

N=60

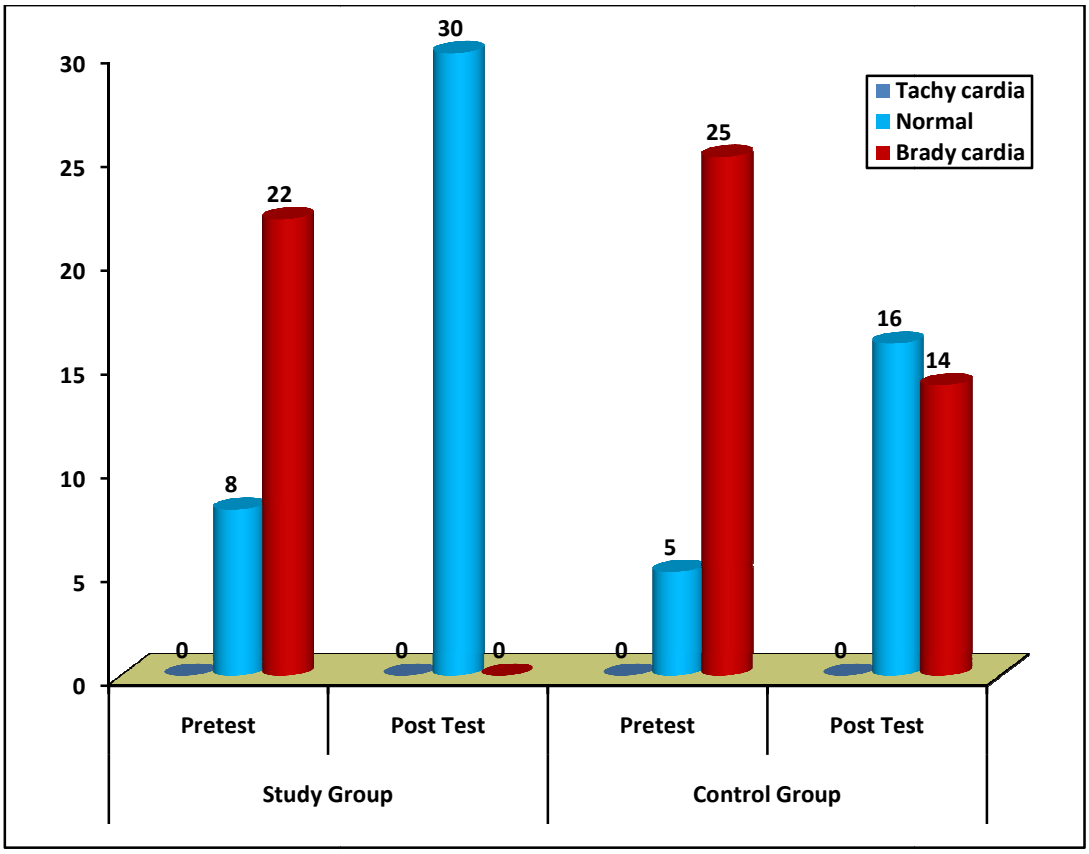


Figure 4.3.3: Comparison of pre and posttest level of Heart Rate among pre term infants between the study and control group

The above figure 4.3.3 illustrates that none of the preterm infant experienced tachycardia in both study and control group. In study group, few infants have maintained normal heart rate and majority of the preterm infants experienced bradycardia in the pretest whereas in the post test all the preterm infants have maintained normal heart rate after the nursing intervention of Kangaroo Mother Care along with the hospital routine (warmer care). However, in the control group, very few infants had normal heart rate and majority of the infants experienced bradycardia in the pretest where as in the post test majority of the preterm infants experienced normal heart rate and some infants experienced bradycardia in the posttest which depicts that the Kangaroo Mother Care along with the hospital routine (warmer care) effectively improves the heart rate of the preterm infants. Hence, the investigator reinforced the intervention of preterm infants to follow KMC for 30 minutes along with hospital routine.

N=60

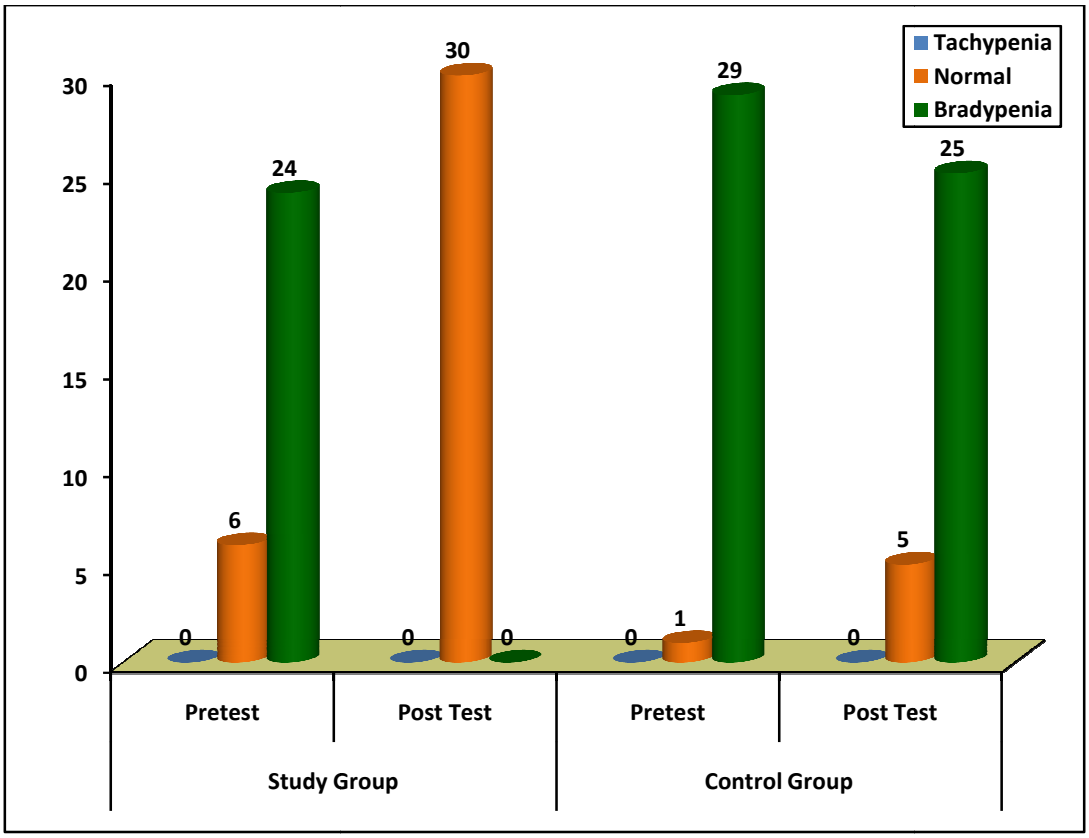


Figure 4.3.4: Comparison of pre and post test level of respiratory rate among pre term infants between the study and control group

The above figure 4.3.4 illustrates that none of the preterm infant experienced tachypenia in both study and control group. Preterm infants in the study group few of them had maintained normal respiration and majority of the preterm infants experienced bradypenia in the pretest whereas in the posttest all the preterm infants had maintained normal respiration .i.e. after the nursing intervention of Kangaroo Mother Care along with the warmer care. However, in the pretest of control group very few of them had maintained normal respiration and majority of the preterm infants experienced bradypenia. Whereas in the posttest of control group few infants had maintained normal respiration and most of the preterm infants experienced bradypenia, which depicts that the Kangaroo Mother Care along with the hospital routine effectively improves the respiration of the preterm infants. Hence, the investigator reinforced the intervention of preterm infants to follow KMC for 30 minutes along with hospital routine.

N=60

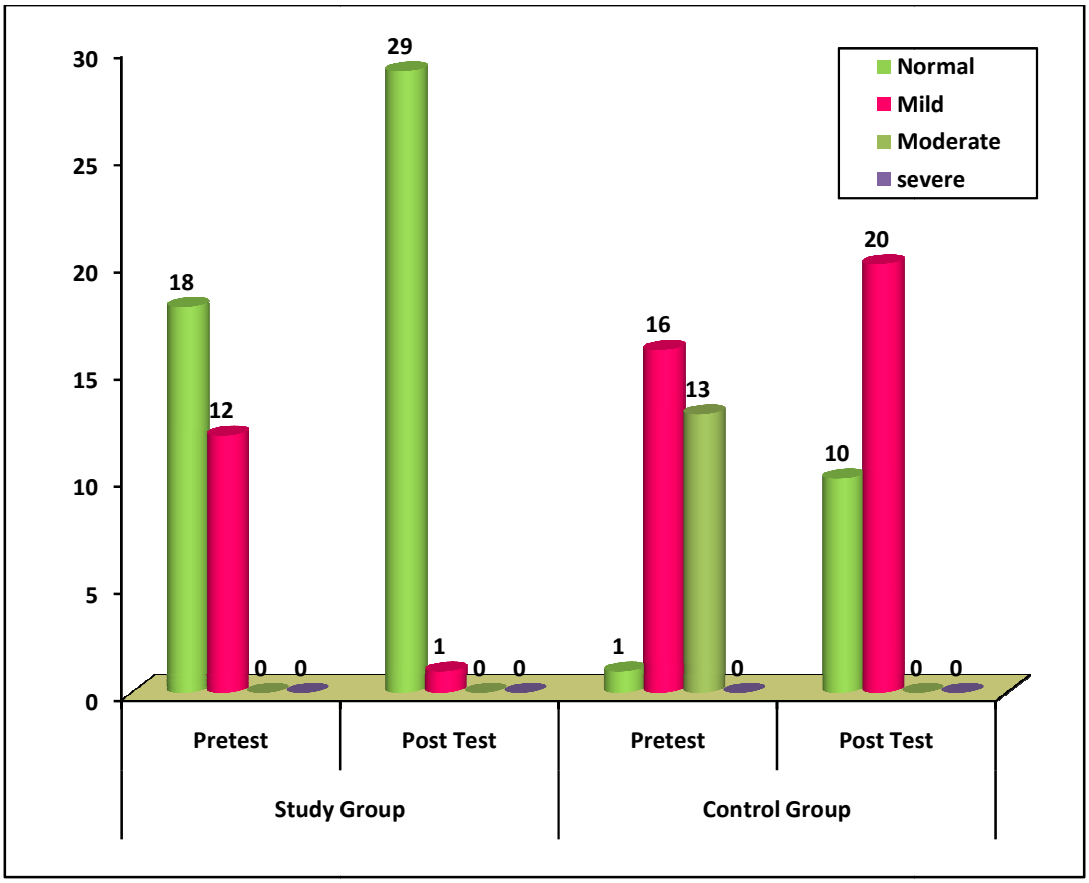


Figure 4.3.5: Comparison of pre and post test level of oxygen saturation among preterm infants between the study and control group

The above figure 4.3.5 shows that none of the preterm infant experienced severe desaturation in both study and control group. Majority of the preterm infants experienced normal saturation and some of the preterm infants experienced mild desaturation in the pretest of study group, whereas in the posttest most of the preterm infants had maintained normal saturation and few infants experienced mild desaturation after the nursing intervention of Kangaroo Mother Care along with the hospital routine (warmer care). However, in the pretest of control group very few of them experienced normal saturation, some of the preterm infant's experienced mild desaturation and moderate de saturation. Whereas in the post test of control group some of the preterm infant's experienced normal saturation and majority of the preterm infants experienced mild de saturation which depicts that the Kangaroo Mother Care effectively improves the oxygen saturation of the preterm infants. Hence, the investigator reinforced the intervention of preterm infants to follow KMC for 30 minutes along with hospital routine.

Table 4.3.6: Effect of Kangaroo Mother Care (KMC) on level of physiological parameters among preterm infant between study and control group

N = 60

Physiological parameters	Study Group Effect Size (r)	Control Group Effect Size (r)
Temperature	0.87	0.85
Heart rate	0.97	0.79
Respiratory rate	0.93	0.86
Oxygen Saturation	0.97	0.93
Weight gain	0.99	0.67

The above table 4.3.6 depicts the effect size of Kangaroo Mother Care on level of physiological parameters between the study group (temperature, heart rate, respiratory rate, oxygen saturation, weight gain) and control group (temperature, heart rate, respiratory rate, oxygen saturation, weight gain) revealed that there was significant effect size in the study group than the control group, which depicts that 30 minutes of Kangaroo Mother Care (three consecutive days) was effectively improving the physiological parameters of the preterm infants.

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SECTION 4.4: ASSOCIATION OF MEAN GAIN SCORE OF PHYSIOLOGICAL PARAMETERS WITH SELECTED DEMOGRAPHIC VARIABLES AMONG STUDY AND CONTROL GROUP.

n=30

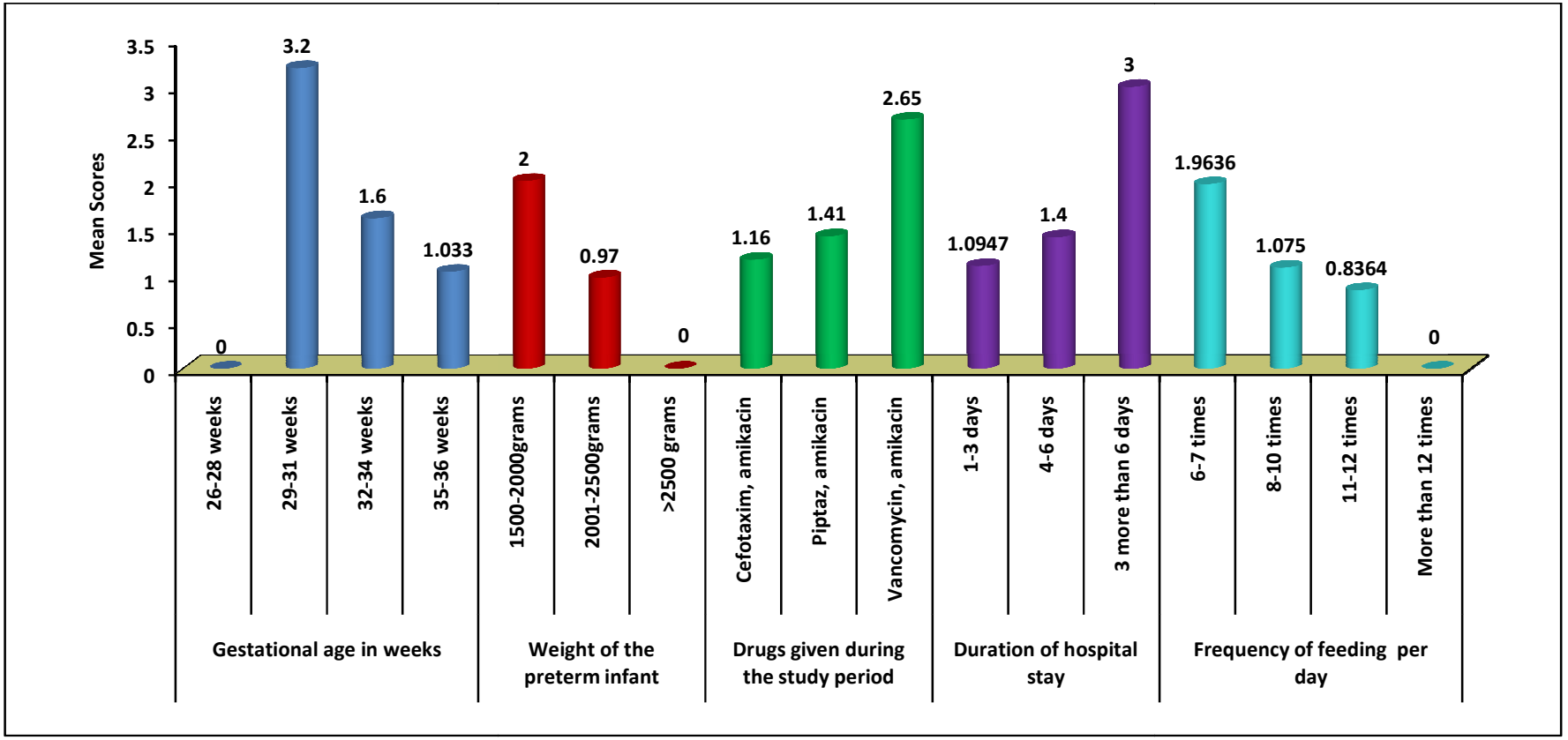

Figure 4.4.1 Association of selected demographic variables with mean gain score of temperature among preterm infants in study group (One way ANOVA)

Figure 4.4.1 illustrates the association of mean gain score of physiological parameters and infers that gestational age with 29-31weeks of preterm infants had more mean temperature gain score than 32-34 weeks,35-36 weeks of gestational age. In relevant to the weight, preterm infants between 1500-2000 grams had more mean temperature gain score than infants between 2001-2500 grams and >2500 grams of weight. In terms drugs given during the study period infants received Vancomycin and Amikacin had more mean temperature gain score than infants received Cefotaxime and Amikacin, Piptaz and Amikacin. In view of duration of hospital stay preterm infants staying more than 6 days had more mean temperature gain score than staying 4-6 days and 1-3 days respectively. In terms of frequency of feeding per day, preterm infants received 6-7 times had more mean temperature gain score than 8-10 times, 11-12 times and more than 12 times feeding respectively.

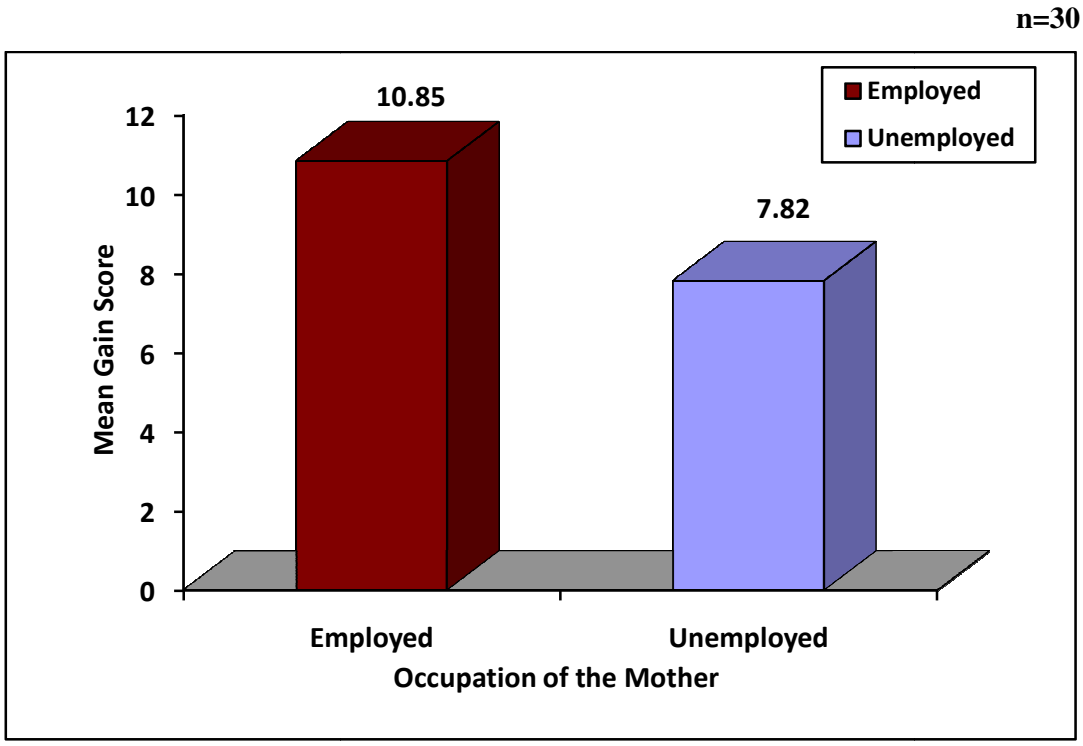

Figure 4.4.2 Association of selected demographic variables with mean gain score of Respiratory rate among preterm infants in study group (One way ANOVA)

Figure 4.4.2 illustrates the association of mean gain score of physiological parameters and infers that the employed mothers of preterm infants had more mean respiratory gain score than the unemployed mothers of preterm infants in the study group.

n=30

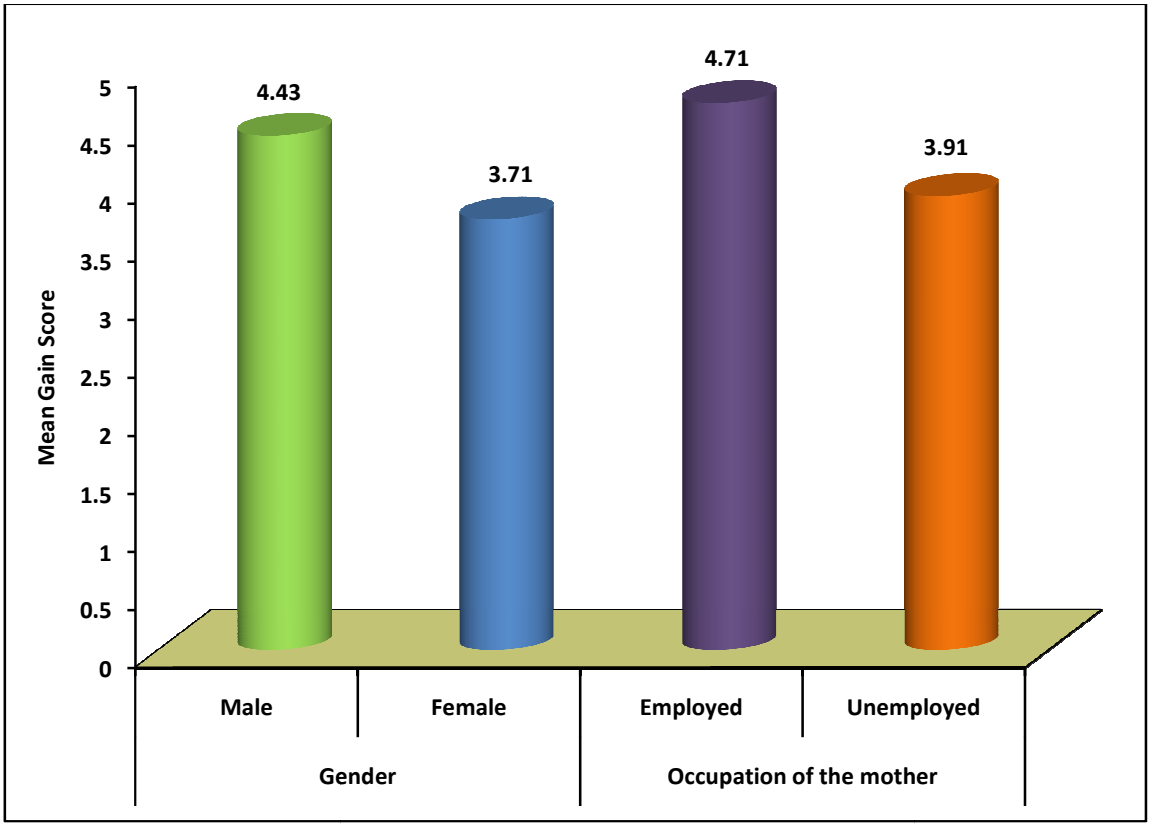

Figure 4.4.3 Association of selected demographic variables with mean gain score of Oxygen saturation among preterm infants in study group (One way ANOVA)

Figure 4.4.3 illustrates the association of mean gain score of physiological parameters and infers that the male infants had more mean oxygen saturation gain score than the female preterm infants. In relevant to the occupation the employed mothers of preterm infants had more mean oxygen saturation gain score than the unemployed mothers of preterm infants in the study group.

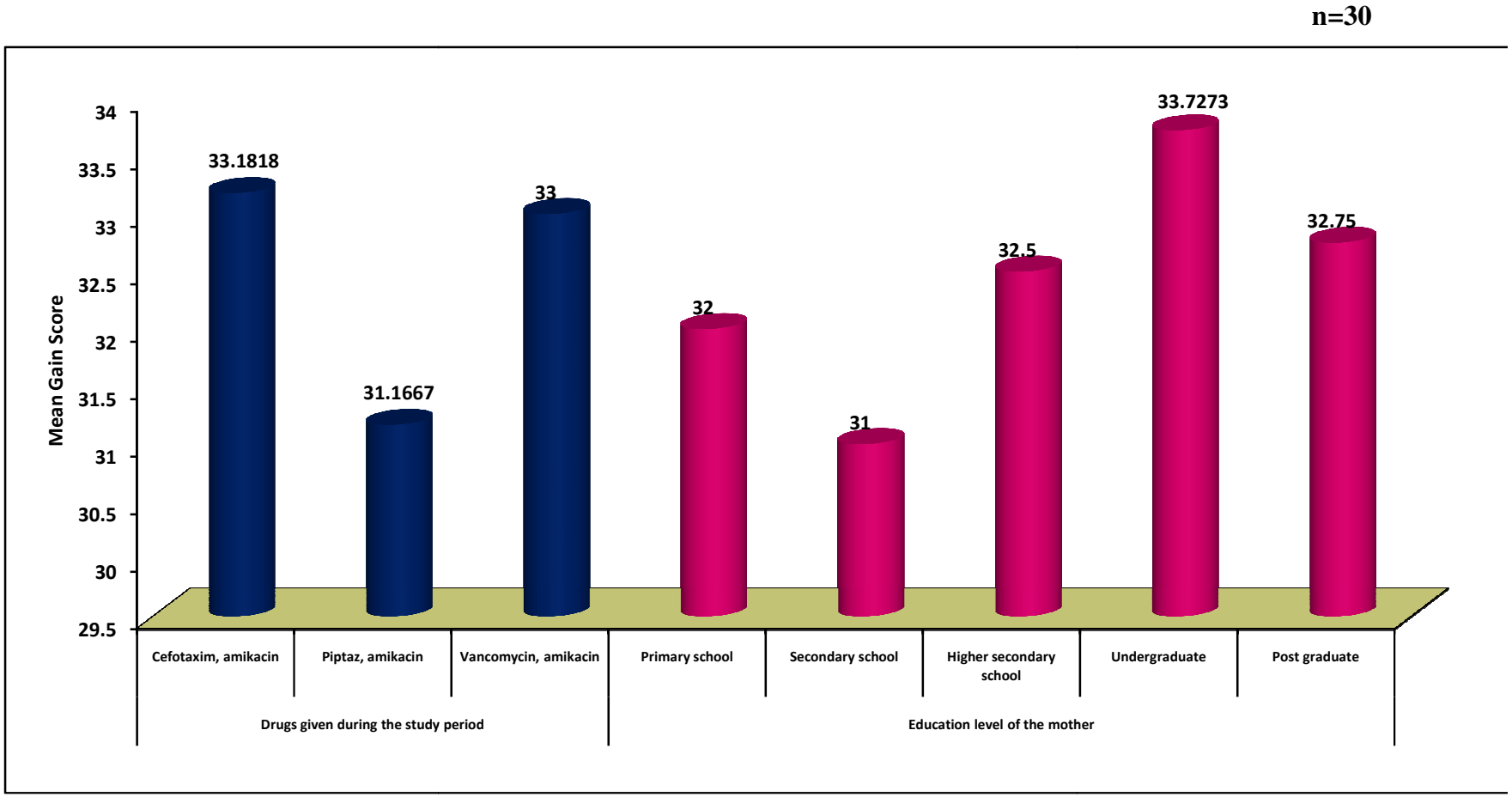

Figure 4.4.4 Association of selected demographic variables with mean gain score of weight among preterm infants in study group (One way ANOVA)

Figure 4.4.4 illustrates the association of mean gain score of physiological parameters and infers that the preterm infants received the drugs of Cefotaxime and Amikacin had more mean weight gain score than the infants received the drugs of Vancomycin and Amikacin, Piptaz and Amikacin. In terms of level of education undergraduate mothers of preterm infants had more mean weight gain score than the post graduate, higher secondary school, primary school and secondary school mothers of preterm infants in the study group.

n=30

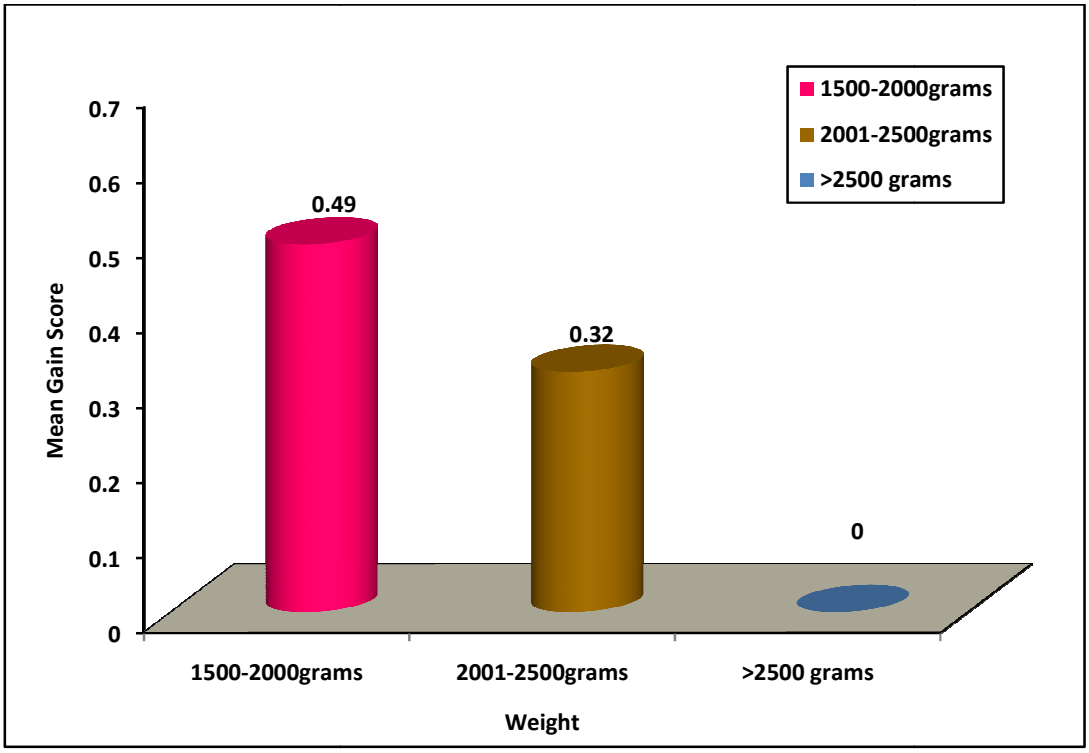

Figure 4.4.5 Association of selected demographic variables with mean gain score of temperature among preterm infants in control group (One way ANOVA)

Figure 4.4.5 illustrates the association of mean gain score of physiological parameters and infers that the preterm infants between 1500-2000 grams had more mean temperature gain score than the infants between the 2001-2500 grams and >2500 grams of preterm infants in the control group.

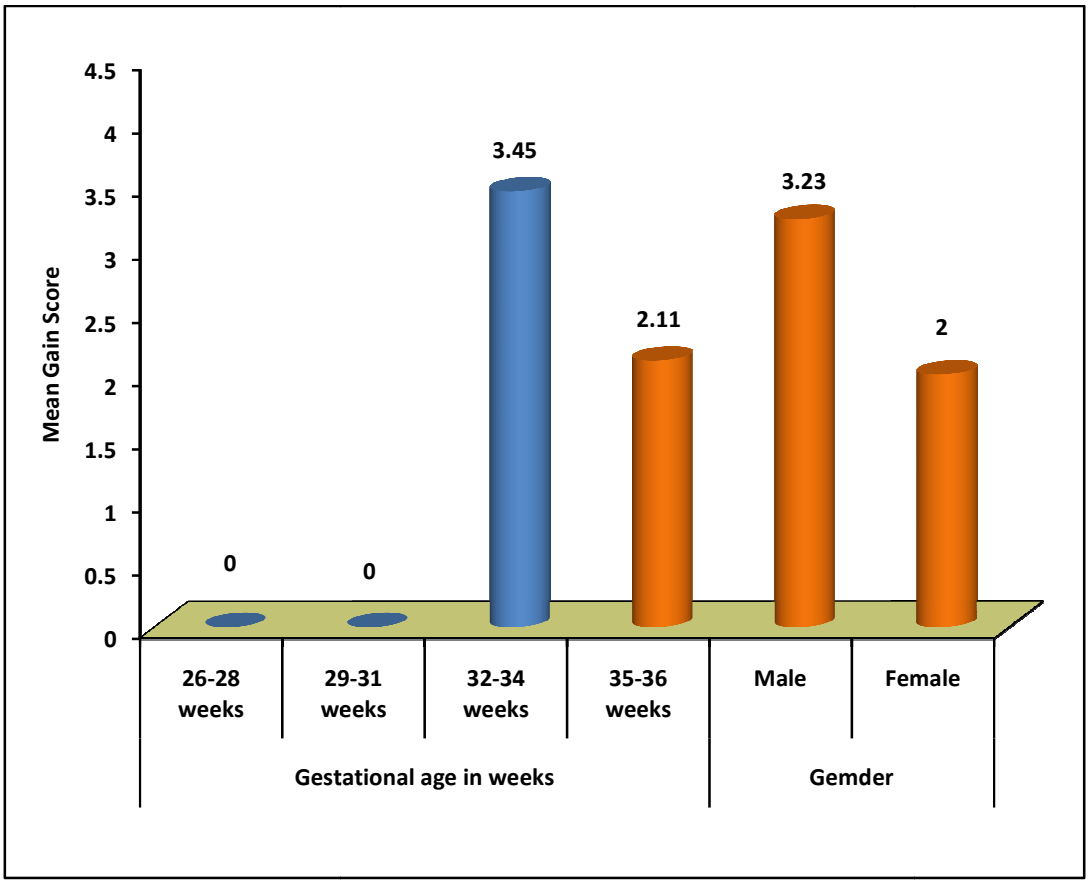

Figure 4.4.6 Association of selected demographic variables with mean gain score of respiratory rate among preterm infants in control group (One way ANOVA)

Figure 4.4.6 illustrates the association of mean gain score of physiological parameters and infers that the preterm infants between the 32-34 weeks of gestation had more mean respiratory gain score than the infants between 35-36 weeks, 29-31 weeks and 26-28 weeks of gestational age. In terms of gender male preterm infants had more mean respiratory gain score than the female preterm infants in the control group.

n=30

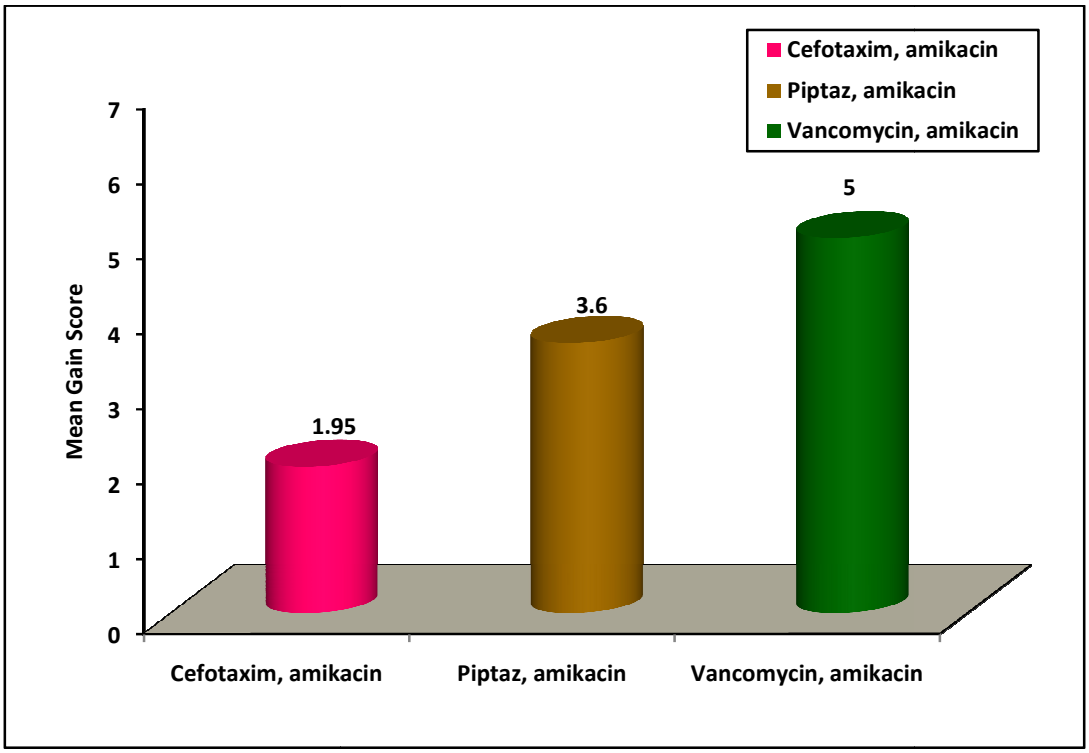

Figure 4.4.7 Association of selected demographic variables with mean gain score of heart rate among preterm infants in control group (One way ANOVA)

Figure 4.4.7 illustrates the association of mean gain score of physiological parameters and infers that the preterm infants received the drugs of Vancomycin and Amikacin had more mean heart rate gain score than the preterm infants received the drugs of Piptaz and Amikacin, Cefotaxime and Amikacin of the preterm infants in the control group.

n=30

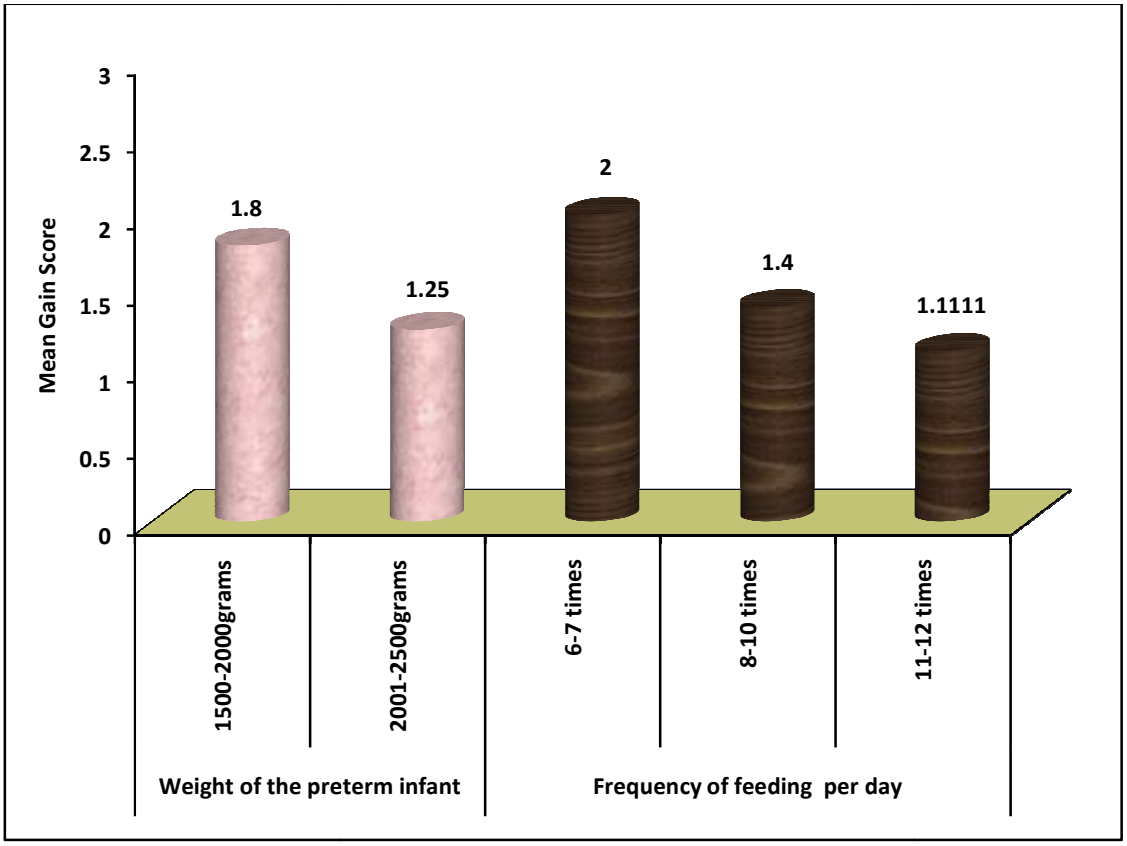

Figure 4.4.8 Association of selected demographic variables with mean gain score of oxygen saturation among preterm infants in control group (One way ANOVA)

Figure 4.4.8 illustrates the association of mean gain score of physiological parameters and infers that the preterm infants between the 1500-2000 grams had more mean oxygen saturation gain score than the infants between the 2001-2500 grams. In relevant to the feeding preterm infants receiving 6-7 times of feeding had more mean oxygen saturation gain score than the 8-10 times and 11-12 times feeding of the preterm infants.

CHAPTER – 5

DISCUSSION

DISCUSSION

This chapter discusses in detail the findings of the study, inferences from the statistical analysis, it is relevant to the objectives of the study and further discussion will represent the objectives that were satisfied by the study. The purpose of the study was to assess the effectiveness of kangaroo mother care on level of physiological parameters among preterm infants.

As per the stated objectives, the findings of the study were discussed.

5.1 Description of demographic variables among preterm infants in the study and control group

The demographic variables of both the study and control group as shown in table 4.1.1 to 4.1.4 depicted that homogeneity of the group was maintained for five demographic variables such as gestational age in weeks, weight of the preterm infant, duration of hospital stay, age of the mother in years, occupation of the mother.

The demographic variables of preterm infants and mothers of the study group as shown in the table 4.1.1 to 4.1.4. Study findings depicted that assessment of demographic variables, the majority of preterm infants belonged to 35-36 weeks of gestational age, males, born between the birth weight of 2001-2500 grams with the birth order of 1and 2 and the preterm infants received direct breast-feeding and paladai feeding respectively had fed between 6-12 times. Majority of the preterm infants received the drugs of Cefotaxime and Amikacin with the duration of 1-3 days of hospital stays. Majority of the preterm infant's mothers have in the age of 26-30 years predominantly under graduate, unemployed, multigravida and using sitting position during the intervention of KMC and communicate with their infants.

In context to control, majority of the preterm infants belonged to 35-36 weeks of gestational age, females, born between 2001-2500 grams with 1st birth order. Majority of the preterm infants received direct breast-feeding and paladai feeding respectively had fed between 8-10 times. Majority of the preterm infants received the drugs of Cefotaxime and Amikacin with the duration of 1-3 days of hospital stays. Most of the

preterm infant's mothers have in the age of 26-30 years predominantly under graduate, unemployed and multigravida.

5.2 The first objective of the study was to assess and compare pre and post test level of physiological parameters among preterm infants in study and control group

The table 4.2.1 presented that the assessment and comparison of pre and post test level of physiological parameters within the study group with paired 't' test and inferred that high level significant differences pertaining to temperature, heart rate, respiratory rate, oxygen saturation and weight at $p<0.001$. The table depicted that KMC along with hospital routine (warmer care) was highly significant to improved the physiological parameters of the preterm infants.

The above table 4.2.2 showed that the assessment and comparison of pre and post test level of physiological parameters within the control group with paired 't' test and inferred that high level significant differences pertaining to temperature, heart rate, respiratory rate, oxygen saturation and weight at $p<0.001$.Preterm infants in the control group underwent the hospital routine (warmer) also had improvement in their physiological parameters.

Indian researchers Helen David M, Margaret Deepa (2012), supported the findings that after providing of Kangaroo Mother Care (skin to skin environment), preterm infants experienced to improved their physiological parameters of temperature,heart rate, respiratory rate, oxygen saturation and weight. The findings were also supported by Gray, Flenady, (2011) as she found that preterm infants are in the NICU treated with the artificial protective environment, sophisticated equipment and various machines that helps to maintain to physiological parameters of the preterm infants. Alpanamayi Bera, Jagabandhu Ghose, Dinesh Munian (2014) founded that Kangaroo Mother Care was compared to warmer care, KMC is non conventional ,low cost method of new born care and the preterm infants mother acting as a warmer and providing all the sensory behavioral and physiological stimulation without sophisticated equipments and machines.

5.3 The second objective of the study was to assess and compare the pre and post test level of physiological parameters among preterm infants between the study and control group.

The table 4.3.1 showed that the assessment and comparison of pre and post test level of physiological parameters between the study and control group with unpaired 't' test and inferred that high level significant differences pertaining to temperature, heart rate, respiratory rate, oxygen saturation at $p<0.001$. The calculated 't' value was -0.039 in the pretest revealed that there was no significant difference in the level of temperature between the study and control group. Where as in the post test the calculated 't' value was 11.29 which showed that there was significant difference in the level of temperature between the study and control group at $p<0.001$.

The calculated 't' value was 0.98 in the pretest revealed that there was no significant difference in the heart rate between the study and control group. Where as in the post test the calculated 't' was 13.48 which showed that there was significant difference in the heart rate between the study and control group at $p<0.001$.

There was significant difference in the level of respiratory rate between study and control group. The pretest calculated 't' value was 3.97 and the calculated post test 't' value was 14.85 which showed that there was significant difference in the study and control group at $p<0.001$.

There was no significant difference in the level of oxygen saturation between study and control group, the calculated 't' value was -0.13. The calculated 't' value was 8.59 in the posttest revealed that there was significant difference in the level of oxygen saturation between study and control group at $p<0.05$ level.

There was no significant difference in the level of weight between the study and control group in the pre test, the calculated 't' value was -0.45. The calculated 't' value was -0.18 in the post test revealed that there was no significant difference in the level of weight between the study and control group $p<0.01$ level.

This table depicted preterm infants those who had underwent the nursing intervention of KMC along with hospital routine had significant improved in the

physiological parameters comparing to the preterm infants underwent the hospital routine only (placed under warmer).

The figure 4.3.2 showed that none of the preterm infant experienced hyperthermia in both study and control group. In the study group majority of the preterm infants experienced mild hypothermia, some of the preterm infants experienced moderate hypothermia and few infants are having normal temperature in the pretest however all the preterm infants are maintained normal body temperature in the posttest. Whereas in control group the majority of the preterm infant's experienced mild hypothermia and some of the preterm infants experienced moderate hypothermia in the pretest however, most of the preterm infants experienced mild hypothermia and very few infants are having moderate hypothermia. This depicted that the Kangaroo Mother Care effectively improved the body temperature of the preterm infants. Hence, the investigator reinforced the intervention of preterm infants to follow KMC for 30 minutes along with hospital routine.

The figure 4.3.3 illustrated that none of the preterm infant experienced tachycardia in both study and control group. In study group, few infants are maintained normal heart rate and majority of the preterm infants experienced bradycardia in the pretest whereas in the post test all the preterm infants have maintained normal heart rate after the nursing intervention of Kangaroo Mother Care along with the hospital routine (warmer care). However, in the control group, very few infants had normal heart rate and majority of the infants experienced bradycardia in the pretest where as in the post test majority of the preterm infants experienced normal heart rate and some infants experienced bradycardia in the posttest which depicts that the Kangaroo Mother Care along with the hospital routine (warmer care) effectively improved the heart rate of the preterm infants. Hence, the investigator reinforced the intervention of preterm infants to follow KMC for 30 minutes along with hospital routine.

The figure 4.3.4 illustrated that none of the preterm infant experienced tachypenia in both study and control group. Preterm infants in the study group few of them had maintained normal respiration and majority of the preterm infants experienced bradypenia in the pretest whereas in the posttest all the preterm infants had maintained normal respiration .i.e. after the nursing intervention of Kangaroo Mother Care along

with the warmer care. However, in the pretest of control group very few of them had maintained normal respiration and majority of the preterm infants experienced bradypenia. Whereas in the posttest of control group few infants had maintained normal respiration and most of the preterm infants experienced bradypenia, which depicts that the Kangaroo Mother Care along with the hospital routine effectively improved the respiration of the preterm infants. Hence, the investigator reinforced the intervention of preterm infants to follow KMC for 30 minutes along with hospital routine.

The figure 4.3.5 showed that none of the preterm infant experienced severe desaturation in both study and control group. Majority of the preterm infants experienced normal saturation and some of the preterm infants experienced mild desaturation in the pretest of study group, whereas in the posttest most of the preterm infants had maintained normal saturation and few infants experienced mild desaturation after the nursing intervention of Kangaroo Mother Care along with the hospital routine (warmer care). However, in the pretest of control group very few of them experienced normal saturation, some of the preterm infant's experienced mild desaturation and moderate desaturation. Whereas in the post test of control group some of the preterm infant's experienced normal saturation and majority of the preterm infants experienced mild desaturation which depicted that the Kangaroo Mother Care effectively improved the oxygen saturation of the preterm infants. Hence, the investigator reinforced the intervention of preterm infants to follow KMC for 30 minutes along with hospital routine.

The above inference concludes that there was significant difference found in the study and control groups. The research investigator showed the effectiveness of KMC with the help of effect size analysis in the table 4.3.6. Which depicted that, there was significant effects founded in the physiological parameters of preterm infants undergone the Kangaroo Mother Care along with the hospital routine, compared to the preterm infants who are undergone the hospital routine only (warmer). Hence, the Kangaroo Mother Care effectively improved the physiological parameters of the preterm infants for 30 minutes for three consecutive days. However, the research investigator identified that the preterm infants those who are under gone hospital routine of warmer care founded alteration in the physiological parameters documented immediately, informed to the neonatologist and supportive intervention was carry out as per neonatologist in order to prevent the complication.

Sharma, Madabhavi I, et al, (2016) supported the findings; that identified the effects of Kangaroo Mother Care on physiological and behavioral response of the stable preterm infants and he found that the heart rate, respiratory variability was statistically significant after the KMC intervention and the oxygen saturation mean score was less in the KMC group. He concluded KMC was improving the physiological and behavioral stability of the preterm infants. Ghose Rao Sharma (2014) founded that effects KMC on responses to the painful stimuli of the preterm infants, he proved that KMC is a non-pharmacological, easy intervention to manage the procedural pain and reducing the crying duration of the preterm infants.

Krishna M, Uppala R, Gobi Arun, Chodavarapu R, Jeshwanth Singh, (2013) compared the effectiveness of KMC and routine practice on level of physiological parameter among preterm infants. Pre and post physiological parameters were documented after the 30 minutes of KMC and reported that the preterm infants has an beneficial effects and significant changes in the heart rate, temperature, respiratory rate and saturation.

The conceptual framework adopted was **Kolcaba Theory of Comfort,** which strengthen for this study and was helpful for the investigator to carry out the study in an integrated approach. The investigator assessed the basic essential health care needs of preterm infants, assessing the pre test level of physiological parameter by using WHO guidelines and comforting intervention of Ease (Kangaroo Mother Care) administered. The investigator identified the enhanced comfort of the preterm infants (post test) by using the WHO guidelines.

Thus the null hypothesis NH_1 stated earlier that **"There will be no significant difference between pre and post test level of physiological parameters among preterm infants between study and control group at P< 0.05 level was rejected."**

5.4 The third objective was to associate selected demographic variables with the mean gain score of physiological parameters among preterm infants in the study and control group

The study findings were analyzed using one-way analysis of variance for association of selected demographic variables with the mean temperature gain score with selected demographic variables of the study group.

Figure 4.4.1 illustrated the association of the mean gain score of physiological parameters of preterm infants who were in the study group and inferred that the gestational age with 29-31weeks of preterm infants had more mean temperature gain score than 32-34 weeks,35-36 weeks of gestational age and its highly significant at the level of $p<0.001$. In relevant to the weight, preterm infants between 1500-2000 grams had more mean temperature gain score than infants between 2001-2500 grams and >2500 grams of weight and its highly significant at the level of $p<0.001$. In terms drugs given during the study period infants received Vancomycin and Amikacin had more mean temperature gain score than infants received Cefotaxime and Amikacin, Piptaz and Amikacin and its significant at the level of $p<0.05$. In view of duration of hospital, stay preterm infants stayed more than 6 days had more mean temperature gain score than stayed in 4-6 days and 1-3 days and its highly significant at the level of $p<0.001$.. In terms of frequency of feeding per day, preterm infants received 6-7 times had more mean temperature gain score than 8-10 times, 11-12 times and more than 12 times feeding and its highly significant at the level of $p<0.001$.

With regard to gestational age, preterm infants in the postnatal life having increased metabolic responses to the cold environment. These infants using the non shivering thermogenesis mechanism, as a result release of nor epinephrine from the brown fats in the process of lipolysis, oxidation and esterification of fatty acids, as the consequences body heat produced peripherally and increased blood supply to the brown fat that helps to maintain the body temperature. Robin Knobel, (2012) reported infants up to 32 weeks of gestational age not able to warm and shiver themselves due to insufficient thermogenin and monodeiodinase enzymes. Preterm infants are often going for thermoregulatory process due to inability to produce heat through non-shivering thermo genesis mechanisms. Researchers from the Brazilian Network reported that

infants between 23-33 weeks gestational age found hypothermia and more chances for death because of inefficient thermo genesis mechanism.

With regard to weight, preterm infants have born with low birth weight apparently become hypothermic. Birth weight between 400-1800 grams equivalent to 26-34 weeks of gestational age. Mere stein and Gardner, (2011) suggested thermoregulation determined by gestational age, weight of the infants and maturation of the organs. Robin Knobel, (2012) reported that the energy expenditure of the preterm infants based on basic metabolism, body temperature regulation and body growth. The deposition of brown fat depends upon the body weight and gestational age. Hence, the low birth weight and insufficient thermogenin and monodeiodinase enzymes interfere with the thermoregulatory process of the preterm infants.

With regard to the duration of the hospital stays, Smith J (2012) contributed that, hypothermia is the main problems of preterm infants, while in the NICU the preterm infants are often exposed to various nursing care and procedures and susceptible to exposure of cold stress. Preterm infants are having the impaired thermoregulatory process as it has impact on maintaining thermoregulation

With regard to drugs, Gian Maria Pacifici, (2012) contributed that the Vancomycin clearance is significantly lower in preterm infants compared to the term neonate and adults. Vancomycin is cleared by renal glomerular filtrations. An immature organ of the preterm infants has a functional limitation of the glomerular tubules. Brian Anderson et al (2012); Vancomycin clearance positively affected by weight, gestational age and postnatal age and negatively affected by creatinine levels.

With regard to the frequency of feeding, the energy supplementation depends upon the feeding pattern and it was very essential for the organ development, body homeothermia and optimal growth. Delanaud (2010) reported the fact increase feeding pattern stimulate the activation of brown fat leads to ability to produce non shivering thermo genesis mechanisms and its theoretically proved feeding pattern helps to maintain the thermoregulation.

Figure 4.4.2 illustrated that the association of the mean gain score of respiratory rate and their selected demographic variables in the study group describes that the employed mothers of preterm infants had more mean respiratory gain score than the unemployed mothers of preterm infants and its significant association with respiratory rate at the level of $p<0.05$. With regard to occupation, maternal occupation during the antenatal period the mothers of preterm infants undergone for various unfavorable working environment such as long standing, stress job dissatisfaction, increased working hours, shift working, exposure of chemicals, noxious substances that affect the lung development and poor alveolar formation , low birth weight, respiratory distress. Hence, the occupation of the mother is associated with the respiratory status of the preterm infants.

Figure 4.4.3 illustrated that the association of the mean gain score of oxygen saturation and their selected demographic variables in study group inferred that the male infants had more mean oxygen saturation gain score than the female preterm infants and its significant association with oxygen saturation at the level of $p<0.05$. In relevant to the occupation the employed mothers of preterm infants had more mean oxygen saturation gain score than the unemployed mothers of preterm infants and its significant association with oxygen saturation at the level of $p<0.05$. With regard to gender, compared to female infants, male infants are more susceptible to having the postnatal complication including APGAR score, increased oxygen requirement, poor neonatal respiratory outcome. Significantly, female infants are easily achieving the oxygen saturation than the male infants.

Figure 4.4.4 illustrated that the association of the mean gain score of weight and their selected demographic variables in study group inferred that the preterm infants received the drugs of Cefotaxime and Amikacin had more mean weight gain score than the infants received the drugs of Vancomycin and Amikacin, Piptaz, Amikacin and it has significantly associated with weight at the level of $p<0.05$. Those recorded antibiotics reduces infection there by increased the weight gain. In terms of education undergraduate mothers of preterm infants had more mean weight gain score than the post graduate, higher secondary school, primary school and secondary school mothers of preterm infants and it has significantly associated with weight at the level of $p<0.05$.

Figure 4.4.5 illustrated that the association of the mean gain score of temperature and their selected demographic variables in control group inferred that the preterm infants between 1500-2000 grams had more mean temperature gain score than the infants between the 2001-2500 grams and >2500 grams of preterm infants and its significant association with temperature at the level of $p<0.05$.

Figure 4.4.6 illustrated that the association of mean gain score of respiratory rate and their selected demographic variables in control group described that the preterm infants between the 32-34 weeks of gestation had more mean respiratory gain score than the infants between 35-36 weeks, 29-31 weeks and 26-28 weeks of gestational age and its significant association with respiratory rate at the level of $p<0.01$. Male preterm infants had more mean respiratory gain score than the female preterm infants and its significant association with respiratory rate at the level of $p<0.05$.

Figure 4.4.7 illustrated the association of mean gain score of heart rate and their selected demographic variables in control group described that the preterm infants received the drugs of Vancomycin and Amikacin had more mean heart rate gain score than the preterm infants received the drugs of Piptaz and Amikacin, Cefotaxime and Amikacin it has significant association with the heart rate at the level of $p<0.05$.

Figure 4.4.8 illustrated the association of mean gain score of oxygen saturation and their selected demographic variables in control group described that the preterm infants between the 1500-2000 grams had more mean oxygen saturation gain score than the infants between the 2001-2500 grams. In relevant to the feeding preterm infants receiving 6-7 times of feeding had more mean oxygen saturation gain score than the 8-10 times and 11-12 times and its significant association with the oxygen saturation at the level of $p< 0.05$.

Thus the null hypothesis NH_2 stated earlier **There is no significant association of selected demographic variables with the mean differed score level of physiological parameters among preterm infants in study and control group at P< 0.05 level was rejected.**

CHAPTER – 6

SUMMARY, CONCLUSION, IMPLICATIONS, RECOMMENDATIONS AND LIMITATIONS

SUMMARY, CONCLUSION, IMPLICATIONS, RECOMMENDATIONS AND LIMITATIONS

This chapter gives out the summary, conclusion, implications, recommendations and limitations of the study based on objectives selected

6.1 SUMMARY

India has the highest number of Neonatal Mortality Rate due to prematurity and preterm birth. Many of the infant's loss their life in the first 28 days due to prematurity. Preterm infants are unable to sustain in their external uterine environment. Even though many advanced technologies and sophisticated environment presents in the NICU to saving the life of the preterm infants but various consequences such as interruption in the maternal and infant bonding, poor sucking, lacking in the neuro behavioral development, psychological interruption arises in their post natal life. Premature infants are difficult to maintain the physiological parameters in their postnatal life as a consequences preterm infants under gone various potential complication. Though there are various intervention are used to treat and stabilize the preterm infants in their post natal life, like mummification ,nesting, swaddling, facilitated tucking, therapeutic massage, kangaroo mother care for more than 24 hours,12,hours,8 hours,6 hours, etc., 30 minutes of KMC for three consecutive days being proved to be easy ,cost effective ,motherly based treatment to maintain the physiological parameters of the preterm infants . In order to minimize the incidence of complication, promotes the early recovery and reduce the length of hospital stays the research investigator decided to adopt this intervention for this study. The researcher conducted this study to assess the effectiveness of Kangaroo Mother Care on level (30 minutes for three consecutive days) of physiological parameters among preterm infants at selected hospitals, Nagercoil. The findings of this study proved that 30 minutes for three days of KMC effectively maintained the physiological parameters of the preterm infants.

The objectives of the study were

1. To assess and compare the pre and post test level of physiological parameters among preterm infants in both study and control group.

2. To assess the effectiveness of KMC on level of physiological parameters among preterm infants.
3. To associate the selected demographic variables with the mean differed score of physiological parameters among preterm infants in study and control group.

The null hypotheses formulated were

NH_1: There is no significant difference between effectiveness of KMC on level of physiological parameters among preterm infant in study and control group at $p<0.05$ level.

NH_2: There is no significant association of selected demographic variables with mean differed score level of physiological parameters in study and control group at $p<0.05$ level.

The review of literature was collected from a variety of primary and secondary sources, along with personal and professional experience and expert's opinion from the field of child health nursing that provided a comprehensive framework for the selection of problem and carry out the objectives of the study. It also reinforced the ideas for framing the conceptual framework, aided to design the methodology and for the development of the tool for data collection.

The conceptual framework for the study was based on Kolcaba Theory of Comfort.

The researcher obtained quantitative research approach and the quasi-experimental pre test- posttest control group design was used to assess the effectiveness of Kangaroo Mother Care on level of physiological parameters among preterm infants. The research study was conducted among the preterm infants who fulfilled the inclusive criteria at NICU of Dr.Jayasekaran and Dr. Jayaharan Hospitals, Nagercoil during the period of data collection. The sample size was 60 preterm infants who were categorized in to study and control group by Non-probability purposive sampling.

The tool constructed for the study has two parts (Data collection tool and intervention tool).

Section A: Assessment of Demographic variables

Structured interview schedule and medical record review to assess the demographic data**.** It includes gestational age in weeks, gender, birth weight in grams, weight of the preterm infant in the day of pretest, birth order, type of feeding, mode of feeding, drugs given during the study period and duration of hospital stay. Demographic data for mothers which includes age of the mother in years, education level of the mother, occupation of the mother, parity of the mother, position of the mother during KMC, communication of the mother during KMC, frequency of feeding per day, previous information about KMC.

Section B: Assessment of physiological parameters for preterm infants based on WHO guidelines.

WHO guidelines used to assess the physiological parameters of the preterm infants which consists of temperature, heart rate, respiratory rate, oxygen saturation and weight.

The medical and nursing experts validated the tool. Pilot study was conducted at Dr.Jayasekaran Memorial Hospital, Nagercoil and results proved that practicable and feasible to proceed with the main study. The reliability of the tool was verified by inter – rater method by using Karl Pearson Correlation Coefficient method by which the reliability obtained was ‘r = 0.8. Thus, the findings specified that the tool was highly reliable to go-ahead with the main study.

The ethical aspect of research was maintained throughout the study by obtaining ethical clearance certificate from ICCR, formal permission from the perspective authorities and parental assent. Confidentiality of privacy was maintained throughout the data collection period and collected data was used only for the research purpose.

The main study was conducted for a period of 4weeks. The collected data was analyzed by using SPSS version 13.

Main findings of the study revealed that

- Descriptive and inferential statistics were used to analyze the collected data. Interpretation and discussion were based on the objectives, null hypotheses, conceptual framework and from various literature review.
- The pre test mean score of physiological parameters of preterm infants 30 minutes before KMC in study group were temperature in °C 35.45, heart rate in beats per minute 117.80, respiratory rate in breath per minute 37.20, oxygen saturation in % 89.57 and weight in grams 2106.33.
- The posttest mean score of physiological parameters of preterm infants after KMC in study group were temperature in °C 36.76, heart rate in beat per minute 129.47, respiratory rate in breath per minute 45.73, oxygen saturation in % 93.67 and weight in grams 2139.10.
- The pre test mean score of physiological parameters of preterm infants in control group were temperature °C 35.46, heart rate in beat per minute 117.17, respiratory rate in breath per minute 34.93, oxygen saturation in % 89.60 and weight in grams 2136.33.
- The posttest mean score of level of physiological parameters of preterm infants in control group were temperature °C 35.83, heart rate in beat per minute 119.50, respiratory rate in breath per minute 37.47, oxygen saturation in % 91.03 and weight in grams 2151.53.
- The pre test analysis of physiological parameters of preterm infants between the study and control group revealed that the mean difference of temperature was -0.006 with 't' value -0.039 and p value 0.969 ; mean difference of heart rate was 0.63 with 't' value 0.98 and p value 0.328; mean difference of respiratory rate was 2.27 with 't' value 3.97 and p value 0.000; mean difference of oxygen saturation was -0.033 with 't' value -0.13 and p value 0.895 and mean difference of weight was -30.00 with 't' value – 0.45 and p value 0.649 which shows the parameters of temperature, heart rate, oxygen saturation and weight in pre test was found statistically not significant between both the groups. However, the pretest respiration value was found statistically significant between both the groups.
- The pos test analysis of physiological parameters of preterm infants between study and control group revealed that the mean difference of temperature was 0.93 with't' value 11.29 and p value 0.000 ; mean difference of heart rate was 9.96

with ‘t’ value 13.48 and p value 0.000; mean difference of respiratory rate was 8.26 with ‘t’ value 14.85 and p value 0.000; mean difference of oxygen saturation was 2.63 with ‘t’ value 8.59 and p value 0.000 and mean difference of weight was-12.43 with ‘t’ value - 0.18 and p value 0.851 which shows all the parameters in post test was found statistically highly significant between both the groups except the weight between both the groups.

- The association of the mean score of temperature and their selected demographic variables in study group describes that gestational age in weeks, weight of the preterm infants, drugs given during the study period, duration of hospital stay, frequency of feeding per day had more mean temperature gain score and its significant association with temperature of preterm infants in the study group.
- The association of the mean score of respiratory rate and their selected demographic variables in study group describes that occupation of the mother in which the employed mother had more mean respiratory gain score and its significant association with respiratory rate of preterm infants in the study group.
- The association of the mean score of oxygen saturation and their selected demographic variables in study group describes that the gender, occupation of the mother had more mean oxygen saturation gain score and its significant association with oxygen saturation of preterm infants in the study group.
- The association of the mean score of weight and their selected demographic variables in study group describes that drugs given during the study period and education level of the mother had more mean weight gain score and its significant association with weight of preterm infants in the study group.
- The association of the mean score of temperature and their selected demographic variables in control group describes that the weight of the preterm infants had more mean temperature gain score and its significant association with temperature of preterm infants in the control group.
- The association of the mean score of respiratory rate and their selected demographic variables in control group describes that gestational age in weeks gender had more mean respiratory gain score and its significant association with respiratory rate of preterm infants in the control group.
- The association of the mean score of heart rate and their selected demographic variables in control group describes that drugs given during the study period had

more mean heart rate gain score and its significant association with the heart rate of preterm infants in control group.

- The association of the mean score of oxygen saturation and their selected demographic variables in control group describes that weight of the preterm infants and duration of feeding per day during the study period had more mean oxygen saturation gain score and its significant association with the oxygen saturation of preterm infants in control group.

6.2 CONCLUSION

The present study assessed the effectiveness of KMC for 30 minutes for three consecutive days on level of physiological parameters among preterm infants. The study findings proved that the KMC for 30 minutes for three consecutive days was effective in improving the physiological parameters of preterm infants. Kangaroo Mother Care also improves the behavioral and psychological wellness of the preterm infants. The health care providers in their practice while caring for the preterm infants in the NICU, postnatal ward and home settings can utilize KMC. Hence, it can be used as a simple, cost effective, motherly based nursing measure for maintain the physiological parameters of the preterm infants and it can used as a routine care of preterm infants.

6.3 IMPLICATIONS

The investigator has drawn the following implications from the study that is a vital concern for nursing practice, nursing education, nursing administration and nursing research**.**

6.3.1 Nursing Practice

1. The pediatric nurses can adopt Kangaroo Mother Care for 30 minutes for three consecutive days as simple, cost-effective, non-pharmacological, motherly based nursing measures in care of preterm infants at their clinical practice.
2. The pediatric nurse has a great opportunity and plays an important role in maintaining the physiological parameters of the preterm infants through KMC for 30 minutes for three consecutive days.
3. The pediatric nurse practitioners can develop a protocol for KMC for 30 minutes for three consecutive days in their daily routine.

4. KMC can be taught and practiced by the mothers of all preterm infants and term infants, primary health care workers in the primary health care centres as part of their routine care.
5. The pediatric nurse should disseminate the information about Kangaroo Mother Care to the mothers of all preterm infants admitted in the Neonatal Intensive Care Units.

6.3.2 Nursing Education

1. The pediatric nurse as a nurse educator can integrate the major study findings in the nursing curriculum at various levels to build up and train the students to assess the level of physiological parameters among preterm infants by using WHO guidelines and to prevent the long-term consequences of the preterm infants.
2. The nurse educator must promote the student nurses to gain skills required to practice Kangaroo Mother Care for 30 minutes for three consecutive days to improve the physiological parameters of the preterm infants.
3. The educational institutions must offer opportunities for the nursing students to be exposed to such training programmes

6.3.3 Nursing Administration

1. The research has been successfully implemented in Dr. Jayasekaran and Dr.Jayaharan hospitals Nagercoil.
2. The pediatric nurse administrator along with the governing bodies and other health care agencies can formulate a program to focus on the nursing measures of KMC for 30 minutes for three consecutive days to maintain the physiological parameters of preterm infants.
3. This study can be utilized as policy to train the nursing students.
4. The nurse administrator within the institution should motivate and train the staff to carry out periodical surveillance and present an updated incidence on level of physiological parameters of preterm infants.
5. The nurse administrator should take initiation to conduct the CNE, conferences and workshop on various trends of Kangaroo Mother Care for 30 minutes for three consecutive days on level of physiological parameters among preterm infants.
6. The nurse administrator can allot separate budget for in-service education to disseminate the research findings to all neonatal nurses and pediatric nurses.

6.3.4 Nursing Research

1. The findings of the study can be disseminated to the nurses working in Neonatal Intensive Care Units (NICU) and student nurses through various media.
2. The generalization of the study results can be made further replication of the study in various settings and larger population.
3. More research can be done conducted to assess the effectiveness of Kangaroo Mother Care for 30 minutes for twice a day or thrice a day for three days and more than three days on level of physiological parameters among preterm infants.

6.4 RESEARCH DISSEMINATION

1. Research findings of the main study will be presented in the upcoming National and International conference and workshops.
2. Research results will be submitted in online journal of ICCRJNR
3. Research findings will be communicated through posters and newspaper articles.

6.5 UTILIZATION OF RESEARCH FINDING

1. The research was successfully implemented in Dr.Jayasekaran Memorial Hospital and Dr. Jayaharan Hospitals Nagercoil. A protocol on KMC will be created and framed for NICU, Dr.Jayasekaran and Dr. Jayaharan Hospital and which will be promoted by ICCR, Omayal Achi College of Nursing.
2. A protocol on KMC will be framed and utilized in various other NICU's and preterm wards in various hospitals affiliated to Omayal Achi College Of Nursing and pamphlets will be issued to the staff nurses and the care takers at the time of discharge as reinforcement.
3. 30 minutes of KMC will be implemented in the routine nursing care at various NICU's and preterm care units of Dr.Jayasekaran and Dr. Jayaharan Hospital.

6.6 RECOMMENDATIONS

The researcher gives a strong recommendation to the nurses, health care providers, mothers to participate in teaching of 30 minutes for three consecutive days of KMC procedure to maintain level of physiological parameters among preterm infants, which helps to prevent various other neonatal complications.

1. The researcher will recommend implementing the KMC in the clinical area by the students of Omayal Achi College of Nursing and its affiliated hospitals.
2. The study can be replicated with large samples.
3. A study can be conducted to assess the effectiveness of Kangaroo Mother Care for 30 minutes twice a day or thrice a day for three days or more than three days on level of physiological parameters among preterm infants.

6.7 LIMITATION

The investigator found difficulty in getting setting permission and number of samples within the scheduled time and it was rectified by selecting samples from two hospitals.

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APPENDICES

Love to Serve
அறஞ்செய விரும்பு

INTERNATIONAL CENTRE FOR COLLABORATIVE RESEARCH
OMAYAL ACHI COLLEGE OF NURSING
Run by MR Omayal Achi MR Arunachalam Trust

ETHICAL CLEARANCE CERTIFICATE

Valid from: December 2014

Valid to : October 2016 (2 years)

Name of the Principle Investigator: Ms.Chandralekha, M.Sc. (N) Student (Child Health Nursing)

The **ICCR** Ethical Committee meeting held on 22.12.2014 had reviewed the project titled **"A quasi experimental study to assess the effectiveness of Kangaroo Mother Care [KMC] on level of Physiological parameters among Preterm infants at selected hospitals, Nagercoil."** The proposal was found to be acceptable on ethical grounds. The Principle Investigator has the responsibility and accountability for any other administrative / regulatory approvals that may pertain to this research project and for ensuring that the authorized research is carried out according to the conditions outlined in the original protocol submitted for ethics review.

This certificate of approval is valid for the time period provided, there is no change in the methodology protocol or consent process and documents.

Any significant change should be reported to Director for Research Committee considerations in advance for its implementation.

Signature of Research Director :

Signature of Researcher : E. Chandra Lekha

45, AMBATTUR ROAD, PUZHAL, CHENNAI - 600 066. TAMIL NADU, INDIA
Tel : 26591617, 26591618, Fax : 26591616, E-mail : iccrphc@gmail.com, Website : www.omayaln.com

OMAYAL ACHI COLLEGE OF NURSING

Run by MR. Omayal Achi MR.Arunachalam Trust

45, AMBATTUR ROAD, PUZHAL, CHENNAI - 600 066.
(Affiliated to the Tamilnadu Dr.M.G.R. Medical University
Recognized by the Indian Nursing Council & TN Nurses and Midwives Council)

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Tel : 26591617, 26591618
Fax : 26591616
E-mail : oacn1992@gmail.com
Website : omayaln.com

21.12.2015

The Medical Director,
Dr.Jayasekharan Hospital,
K P Road,
Nagercoil
Kanyakumari District-629003.

Sir/Madam,

Sub: Request for permission to conduct
Research Study – reg.

Ms. E. Chandra Lekha, is a bonafide student doing her M.Sc research study at our College and she is conducting "A STUDY TO ASSESS THE EFFECTIVENESS OF KANGAROO MOTHER CARE [KMC] ON LEVEL OF PHYSIOLOGICAL PARAMETERS AMONG PRETERM INFANTS AT SELECTED SETTINGS".

This is for her research project to be submitted to the Tamil Nadu Dr.M.G.R. Medical University in partial fulfillment of the University requirement for the award of M.Sc Degree in Nursing.

Further details of the proposed project will be furnished by the student personally. She will not hinder your routine in any way and she will abide by the rules and regulations of the Hospital. The information collected from your Hospital will be kept confidential. I kindly request you to grant her permission to conduct the study at your Hospital.

Thanking you,

Yours Sincerely,
OMAYAL ACHI COLLEGE OF NURSING

Principal

Permission given to start on 9/5/16.

Dr. RENU DEVAPRASATH,
D.N.B.(Anaesthesia),
MEDICAL ADMINISTRATOR,
Dr. JEYASEKHARAN MEDICAL TRUST,
Dr. JEYASEKHARAN HOSPITAL & NURSING HOME,
NAGERCOIL - 629 003.

OMAYAL ACHI COLLEGE OF NURSING

Run by MR. Omayal Achi MR.Arunachalam Trust

45, AMBATTUR ROAD, PUZHAL, CHENNAI - 600 066.
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Recognized by the Indian Nursing Council & TN Nurses and Midwives Council)

Tel : 26591617, 26591618
Fax : 26591616
E-mail : oacn1992@gmail.com
Website : omayaln.com

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21.12.2015

The Medical Director,
DR. Jayaharan Memorial Hospital
Opp. to. BSNL OFFICE
Nagercoil,
Kanyakumari District-629251.

Sir/Madam,

Sub: Request for permission to conduct
Research Study – reg.

Ms. E. Chandra Lekha, is a bonafide student doing her M.Sc research study at our College and she is conducting "A STUDY TO ASSESS THE EFFECTIVENESS OF KANGAROO MOTHER CARE [KMC] ON LEVEL OF PHYSIOLOGICAL PARAMETERS AMONG PRETERM INFANTS AT SELECTED SETTINGS".

This is for her research project to be submitted to the Tamil Nadu Dr.M.G.R. Medical University in partial fulfillment of the University requirement for the award of M.Sc Degree in Nursing.

Further details of the proposed project will be furnished by the student personally. She will not hinder your routine in any way and she will abide by the rules and regulations of the Hospital. The information collected from your Hospital will be kept confidential. I kindly request you to grant her permission to conduct the study at your Hospital.

Thanking you,

Yours Sincerely,
OMAYAL ACHI COLLEGE OF NURSING
Principal

18/5/16
Dr. Sashya Jayaharan,
M.D.,D.C.H.,
DR. JAYAHARAN MEMORIAL HOSPITAL,
COURT ROAD,
NAGERCOIL - 629 001
Reg. No: 37727.

APPENDIX – C

REQUISITION LETTER FOR CONTENT VALIDITY

From

Ms. Chandralekha.E,

M.sc (N) I year,

Omayal Achi College of Nursing,

No. 45, Ambattur road, Puzhal,

Chennai- 66.

To

Respected Madam,

Subject: Requisition for expert opinion for content validity.

I am Ms. Chandralekha.E doing my M.sc Nursing I year specializing in Child Health Nursing at Omayal Achi College of Nursing under the guidance of Dr.Mrs.S Kanchana, Research Director, ICCR and Speciality Guide Ms.Nandhini .P, Nurse researcher cum Assistant Professor, ICCR, Child Health Nursing. As a part of my research project to be submitted to the Tamil Nadu Dr. M.G.R. Medical University December 2014 session and in partial fulfilment of the University requirement for the award of M.Sc. (N) degree, I am conducting **"A study to assess the effectiveness of kangaroo mother care (KMC) on level of physiological parameters among preterm infants at selected hospitals, Chennai".** I have enclosed my data collection and intervention tool for your expert guidance and validation.

Thanking you,

Yours faithfully,

(Ms. Chandralekha.E)

ENCLOSURES:

1. Research proposal
2. Data collection tool
3. Intervention tool
4. Content validity form
5. Certificate for content validity

LIST OF EXPERTS FOR CONTENT VALIDITY

MEDICAL EXPERTS

1. **Dr. M.Thiravium Mohan.**
   MBBS, DCH,
   Consultant Pediatrician and Neonatologist,
   Dr. Jayasekaran Memorial Hospital,
   Nagercoil,kanyakumari – 629 003, Tamil Nadu.

2. **Dr. T. Ramesh Kumar**
   MBBS, MD ,Neonatologist,
   Dr.Jayaharan Hospital,
   Nagercoil , Kanyakumari – 629 001, Tamil Nadu.

3. **Dr. S. Muthuvel**
   MBBS, MD,
   Consultant Pediatrician ,
   Sir Ivan Stedford Hospital, Ambattur,
   Chennai -600 062, Tamil Nadu.

CHILD HEALTH NURSING EXPERTS

1. **Mrs. R. Sudha, M.Sc.,(N), ph.D.,**
   Principal, M A Chidambaram College of Nursing,
   Voluntary Health Services, Taramani Post,
   Chennai- 600 113

2. **Mrs. Nesa Sathya Satchi, M.Sc (N),**
   H.O.D, Child Health Nursing,
   Apollo College of Nursing,
   Ayanambakkam,
   Chennai – 600095.

CERTIFICATE FOR CONTENT VALIDITY

This is to certify that the data collection and intervention tool developed by Ms. Chandralekha.E M.Sc (Nursing) 1 year student of Omayal Achi College of Nursing for her study **"A study to assess the effectiveness of Kangaroo Mother Care (KMC) on level of physiological parameters among preterm infants at selected settings"** is validated by the undersigned and she can proceed with this tool to conduct the main study.

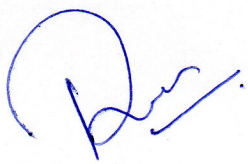
Signature with date:

Seal:

CERTIFICATE FOR CONTENT VALIDITY

This is to certify that the data collection and intervention tool developed by Ms. Chandralekha.E M.Sc (Nursing) 1 year student of Omayal Achi College of Nursing for her study **"A study to assess the effectiveness of Kangaroo Mother Care (KMC) on level of physiological parameters among preterm infants at selected settings"** is validated by the undersigned and she can proceed with this tool to conduct the main study.

Signature with date:



Seal:

Dr. T. RAMESH KUMAR
Reg. No: 66382

CERTIFICATE FOR CONTENT VALIDITY

This is to certify that the data collection and intervention tool developed by Ms. Chandralekha.E M.Sc (Nursing) 1 year student of Omayal Achi College of Nursing for her study **"A study to assess the effectiveness of Kangaroo Mother Care (KMC) on level of physiologicai parameters among preterm infants at selected settings"** is validated by the undersigned and she can proceed with this tool to conduct the main study.

S. Muthuvel

Signature with date:

02/05/16

Dr S MUTHUVEL
MD (Pediatrics)
Consultant Pediatrician

Seal:

CERTIFICATE FOR CONTENT VALIDITY

This is to certify that the data collection and intervention tool developed by Ms. Chandralekha.E M.Sc (Nursing) 1 year student of Omayal Achi College of Nursing for her study **"A study to assess the effectiveness of Kangaroo Mother Care (KMC) on level of physiological parameters among preterm infants at selected settings"** is validated by the undersigned and she can proceed with this tool to conduct the main study. Both content & tool is validated.

R. Sudha

Signature with date: 27/11/15

PRINCIPAL
M.A. Chidambaram College of Nursing
VHS, TTTI Post, Chennai - 600 113.

Seal:

CERTIFICATE FOR CONTENT VALIDITY

This is to certify that the data collection and intervention tool developed by Ms. Chandralekha.E M.Sc (Nursing) 1 year student of Omayal Achi College of Nursing for her study **"A study to assess the effectiveness of Kangaroo Mother Care (KMC) on level of physiological parameters among preterm infants at selected settings"** is validated by the undersigned and she can proceed with this tool to conduct the main study.

Signature with date: 23/11/15

(NESA SATHYA SATCHI)

Both content & tool has been validated

Seal:

APPENDIX – D

NO HARM CERTIFICATE FOR THE INTERVENTION

Name of the investigator : Ms. Chandralekha

Name of the intervention : Kangaroo Mother Care.

Time : 30 minutes

Venue : Neonatal intensive care unit.

Benefits of Kangaroo Mother Care:

For infants

- To Maintain optimum body temperature of the preterm infant
- To increase weight gain and reduce stress level of the preterm infant
- To prevent nosocomial infection of the preterm infant
- To reduce incidence of respiratory tract disease of the preterm infant
- To improve cognitive development and motor development of the preterm infant
- To reduce pain responses of the preterm infant
- To improve sleep patterns of the preterm infant
- To reduce the length of hospital stays

For the mother

- To improve confident to nurture their baby to relieve their stress
- To promotes attachment and bonding
- To improve parental confidence
- To promote increased milk production

Indications of Kangaroo Mother Care:

- Preterm infants with hemodynamically stable
- Preterm infants born between 26-36weeks of gestation
- Preterm infants weighing > 1500gm

Contraindications of Kangaroo Mother Care:

- Preterm infants with hemodynamically unstable
- Preterm infants born before 26weeks of gestation
- Preterm infants with congenital anomalies
- Preterm infants whose mother is affected with contagious disease
- Preterm infants whose mother has impaired thermo regulatory process

Pre-procedure

- The investigator establishes rapport with the mother.
- The investigator explains and demonstrates the procedure, importance and the benefits of Kangaroo Mother Care (KMC) in order to create awareness and alleviate the fear and anxiety through power point presentation for 10-20minutes.
- The investigator obtains the informed written consent and assesses the demographic variables from the mother and the medical records.

Preparation of the articles:

Articles	Numbers	Rationale
A clean tray containing:		
Omron Digital thermometer	1	➢ To check the temperature of the preterm infants before and after KMC
Calibrated Portable pulse oxymeter	1	➢ To check the oxygen saturation and heart rate of the preterm infants before and after KMC
Cotton balls in a container	2	➢ To wipe the axilla and digital thermometer.
Calibrated Infant weighing scale	1	➢ To check weight of the preterm infant before and after KMC
Kidney tray	1	➢ To collect the waste
Autoclaved cotton sheet	1	➢ To wrap and support the mother and the baby

Preparation of the environment:

- The investigator arranges all the necessary articles and put off the fan, maintains privacy and maintains the room temperature.

Preparation of the preterm infant:

- The investigator checks the preterm infant's physiological parameters such as Temperature, Heart rate, Respiration, Oxygen saturation, Blood glucose, Weight, Breast feeding status and records immediately.
- The investigator undresses the baby and the baby should be worn only the diaper, cap and shocks.

Preparation of the mother:

- The investigator asks the mother to perform maternal hygiene such as daily bath/sponge, change of clothes, hand washing, and cut short the finger nails.
- The investigator asks the mother to wear front-open light dress as per the local culture.
- The investigator assists the mother to perform Kangaroo Mother Care in a comfortable sitting position.

Preparation of the investigator:

- The investigator arranges all the necessary articles at bedside and performs hand hygiene, wear cap mask and apron.

During the procedure:

- The investigator assists the mother to perform Kangaroo Mother Care with the preterm infants for 30 minutes. The investigator place the preterm infant between the mother's breast in an perpendicular position such the head turn to one side in slightly extended position, flex and abduct the arms and hip in a frog like position. Place the preterm abdomen at the level of mother's epigastrium and support both the mother and the preterm by autoclaved cotton sheet for 30 minutes for three consecutive days.

After the procedure:

- The investigator places the preterm in a comfortable position. The investigator checks and documents the physiological parameters after the procedure for three consecutive days. Preterm infants are allowed to perform their routine activities.

Preterm infants are difficult to maintain the physiological parameters due to the immaturity, supported by incubator and warmer. Preterm infants in NICU will be given by a simple, cost effective and easiest nursing measure Kangaroo Mother Care to maintain the normal physiological parameters. The above mentioned intervention is safe, secure and will not harm to the preterm infants.

Signature with date :

Seal :

APPENDIX – E

CERTIFICATE FOR ENGLISH EDITING

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Ms.Chandralekha, M.Sc nursing 2014-2016 Batch student Omayal Achi College of nursing Chennai, conducted a dissertation work on **"A quasi experimental study to assess the effectiveness of kangaroo mother care (KMC) on level of physiological parameters among preterm infants at selected Hospitals, Nagercoil,2016"** under the guidance of Ms.Nandhini.P, Assistant professor as a partial fulfillment of The Tamil Nadu Dr. M.G.R Medical University requirement for the award of M.Sc Nursing degree is edited for English language appropriateness by_____.

PRINCIPAL
St. Francis Assisi
Matriculation High. School
Mathal, Boothapandy Post
629 852, K. K. Dist.

Seal:

Signature with Date

CERTIFICATE OF TAMIL EDITING

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Ms.Chandralekha, M.Sc nursing II year student of Omayal Achi College of nursing Chennai, conducted a dissertation work on **"A quasi experimental study to assess the effectiveness of kangaroo mother care (KMC) on level of physiological parameters among preterm infants at selected Hospitals, Nagercoil, 2016"** under the guidance of Ms.Nandhini.P, Nurse researcher cum Assistant Professor, ICCR, Omayal Achi College of Nursing, as a partial fulfilment of The Tamil Nadu Dr. M.G.R medical university requirement for the award of M.Sc Nursing degree is edited for Tamil language appropriateness by A. NATARAJAN

Signature with Date:

A. NATARAJAN, M.A., B.Ed.,
B.T. TEACHER, (TAMIL)
P.U.M. SCHOOL, KUTHAMPOONDI,
VIKRAVANDI BLOCK,
Seal : VILLUPURAM DISTRICT. 605 652

APPENDIX – F

INFORMED WRITTEN CONSENT FORM

I father or mother of _____aged _____ understand that my child (younger than 18 years of age) being asked to participate in a research study conducted by Ms.Chandralekha.E, M.sc nursing student of Omayal Achi College of Nursing Puzhal. This research study will evaluate **"effectiveness of kangaroo mother care on level of physiological parameters among preterm infants at selected hospitals, Nagercoili.** If I agree to participate my child in the study, I will be given structured questionnaire to know the demographic variable and my child will be observed for the level of physiological parameters by using WHO guidelines. I understand that, I have to sit (or) lie-down and my infant will be kept between my breast and covered with a cloth for 30 minutes in a day for 3 consecutive days for improving my infant health. The data will be kept confidential. No identifying information will be included during the analysis process. I understand that there are no risks associated with this study.

I realize that the knowledge gained from this study may help either my child or other children in the future. I realize that my child's participation in this study is voluntary and I may withdraw my child from the study at any time I wish. If I decide to discontinue my child's participation in this study, my child will be continued to be treated in the usual and customary fashion.

I understand that all study will be kept confidential. However, this information may be used in nursing publication or presentations. If I need to, I can contact Ms. Chandralekha.E, M.sc Nursing 1st year Omayal Achi College of Nursing, Puzhal phone no: 04426501617 at any time during the study. The study has been explained to me. I have read and understood the consent form, my entire question has been answered, and I agree to participate my child in the study. I understand that I will be given a copy of this signed consent form.

---------- ----------

Thumb print/Signature of parent Date:

---------- ----------

Signature of investigator Date:

முன் அறிவிப்பு ஒப்பந்த படிவம்

உமையாள் ஆச்சி செவிலியர் கல்லூரியின் சார்பில் முதுநிலை பட்டப்படிப்பு முதலாம் ஆண்டு பயிலும் செல்வி சந்திரலேகா அவர்களால் நடத்தப்படும் இந்த ஆய்வில் நான் _____ தாய்/தந்தை _____ வயது உள்ள எனது குழந்தை பங்கேற்க கேட்டுக் கொண்டதை ஏற்று கொள்கிறேன். இந்த ஆராய்ச்சியானது பச்சிளம் குழந்தை, தவிர சிகிச்சை பிரிவில், குறை மாதத்தில் பிரசவித்த எனது குழந்தைக்கு உடலியக்க வரை சூறுகளை சீராக வைத்து கொள்ள ஒரு எளிய வழிமுறையைப் பற்றிய ஆய்வாகும்.

இந்த ஆய்வுக்கு நான் எனது குழந்தையின் பங்களிப்பை ஒப்பு கொண்டால், என்னிடம் கேட்டப்படும் அனைத்துக் கேள்விகளும் பதிவு செய்து பாதுகாக்கப்படும் என்பதையும், என் குழந்தையை அரை மணி நேரம் எனது மார்பகங்களின் இடையில் வைத்து சிகிச்சை அளிப்பார்கள் எனவும் எதன் மூலம் எனது குழந்தைக்கு எந்த பாதிப்பும் இல்லை என்பதையும் அறிவேன், இந்த ஆய்விலிருந்து நான் விலகி கொள்ளவும் எனக்கு முழு உரிமை உண்டு என்பதையும் அறிவேன். அவ்வாறு இவ்வாய்விலிருந்து விலகி கொள்ளும் பட்சத்தில் என் குழந்தைக்கு மற்ற குழந்தைகள் போலவே சிகிச்சை நடத்தப்படும் என்பதையும் நான் அறிவேன்.

என் குழந்தையைப் பற்றிய அனைத்து தகவல்களும் இரகசியமாக பாதுகாக்கப்படும் என்பதையும் தேவைப்படும் போது ஆய்வின் முடிவுகள் மற்றும் புகைப்படங்கள் செவிலியர் சார்ந்த பத்திரிக்கைகளிலும் வெளியிட முழு சம்மதம் அளிக்கிறேன். இந்த ஆய்வில் தெவைப்படும் போது எப்போது வேண்டுமானாலும் செல்வி சந்திரலேகா அவர்களை உமையாள் ஆச்சி செவிலியர் கல்லூரியில் தொடர்பு கொள்ளலாம் என்பதை நான் அறிவேன்.

இந்த ஆய்வு பற்றிய முழு விளக்கமும் எனக்கு தெரிவிக்கப்பட்டது. இந்த ஆய்விற்கு தேவையான கேள்விகளுக்கு தகுந்த பதில்களை அளித்து ஆய்வில் முழு மனதுடன் எனது குறைமாதத்தில் பிரசவித்த குழந்தையை பங்கு கொள்ள சம்மதம் அளிக்கிறேன் இந்த ஒப்பந்த படிவத்தின் நகல் எனக்கு அளிக்கப்படும் என்றும் அறிவேன்.

பெற்றோரின் கையொப்பம்/கைரேகை **தேதி:**

ஆராச்சியாளரின் கையொப்பம் **தேதி:**

APPENDIX – G

RESEARCH TOOL

PART-1 DEMOGRAPHIC DATA

Demographic variables for preterm infants

Instructions: Choose appropriate option & Tick mark in the box given.

Gestational age in weeks

A. 26-28 weeks

B. 29-31 weeks

C. 32-34 weeks

D. 35-36weeks

2. Gender

A. Male

B. Female

3. Birth weight in grams

A. 1500-2000grams

B. 2001-2500grams

C. >2500grams

4. Weight of the preterm infant in the day of pre test

5. Birth order

A. 1st baby

B. 2nd baby

C. 3rd baby

D. 4th baby

6. Type of feeding

A. Direct Breast feeding / Expressed Breast milk

B. Formula feeding

C. Combination of a and b

7. Mode of feeding

A. Paladai

B. Naso gastric tube feeding

C. Direct Breast feeding

8. **Drugs given during the study period**

9. Duration of hospital stay

A. 1-3days

B. 4-6days

C. more than 6days

Demographic variables for mother

1. Age of the mother in years

A. 20-25

B. 26-30

C. 31-35

D. Above 35

1. Education level of the mother

A. Primary school

B. Secondary school

C. Higher secondary school

D. Under graduate

E. Post graduate

2. Occupation of the mother

A. Employed

B. Un employed

4. Parity of the mother

A. Primi gravida

B. Multi gravid

5. **Position of the mother during KMC**

A. Sitting position

B. Lying down position

6. Communication of the mother with preterm during KMC

A. Yes

B. No

7. Frequency of feeding per day

A. Every half an hour

B. Half an hour-One hour

C. One hour-One and half an hour

D. Whenever needed

8. Previous information about KMC

A. Yes

B. No

PART – II

Assessment of physiological parameters for preterm infants based on WHO guidelines.

Parameters	Inference	Range
Temperature(^{0}c)	Hyperthermia	>37.5
	Normal	36.5-37.5
	Mild hypothermia	36.4-35.2
	Moderate hypothermia	32-35.1
	Severe hypothermia	<32
Heart Rate(beats/min)	Tachycardia	>170
	Normal	120-170
	Bradycardia	<120
Respiratory rate (breaths/min)	Tachypnoea	>70
	Normal	40-70
	Bradypnoea	<40
Oxygen saturation (%)	Normal	92-94
	Mild desaturation	90-91
	Moderate desaturation	88-89
	severe desaturation	<88
Weight (g/kg/day)	Normal	> 15
	Mild under weight	14-10
	Moderate under weight	9-5
	Severe under weight	<4

Source: (“Thermal control of the Preterm’s, a practical guide.)

APPENDIX – H

CODING FOR THE DEMOGRAPHIC VARIABLES

Demographic Variables for preterm infants	**Code No.**
1. Gestational age in weeks	
A. 26-28 weeks	1
B. 29-31 weeks	2
C. 32-34 weeks	3
D. 35-36weeks	4
2. Gender	
A. Male	1
B. Female	2
3. Birth weight in grams	
A. 1500-2000grams	1
B. 2001-2500grams	2
C. >2500grams	3
4. Weight of the preterm infant in the day of pre test	
5. Birth order	
A. 1st baby	1
B. 2nd baby	2
C. 3rd baby	3
D. 4th baby	4
6. Type of feeding	
A. Direct Breast feeding / Expressed Breast milk	1
B. Formula feeding	2
C. Combination of a and b	3

7. Mode of feeding

A. Paladai 1

B. Naso gastric tube feeding 2

C. Direct Breast feeding 3

8. Drugs given during the study period

A. Cefotaxim, amikacin 1

B. Piptaz, amikacin 2

C. Vancomycin, amikacin 3

9. Duration of hospital stay

A. 1-3days 1

B. 4-6days 2

C. More than 6days 3

Demographic variables for mother

1. Age of the mother in years

A. 20-25 1

B. 26-30 2

C. 31-35 3

D. Above 35 4

2. Education level of the mother

A. Primary school 1

B. Secondary school 2

C. Higher secondary school 3

D. Under graduate 4

E. Post graduate 5

3. Occupation of the mother

A. Employed 1

B. Un employed 2

4. Parity of the mother

A. Primi gravida 1

B. Multi gravida 2

5. Position of the mother during KMC

A. Sitting position 1

B. Lying down position 2

6. Communication of the mother with preterm during KMC

A. Yes 1

B. No 2

7. Frequency of feeding per day

A. Every half an hour 1

B. Half an hour-One hour 2

C. One hour-One and half an hour 3

D. Whenever needed 4

8. Previous information about KMC

A. Yes 1

B. No 2

APPENDIX – I

BLUE PRINT

S.NO.	CONTENT	ITEM	TOTAL ITEM	PERCENTAGE
1.	**Demographic variables**			
	For preterm infants	1-9	9	
	For mothers of preterm infants	1-8	8	
2.	**Physiological indicator:**			
	• Temperature	1 – 5	5	26.31
	• Heart rate	1 – 3	3	15.78
	• Respiratory rate	1 – 3	3	15.78
	• Oxygen saturation	1 – 4	4	21.05
	• Weight	1 - 4	4	21.05
Total		**19**	**19**	**100%**

APPENDIX – J

INTERVENTION TOOL

KANGAROO MOTHER CARE

Time : 30 minutes

Venue: Neonatal Intensive Care Unit.

Pre-procedure

- The investigator established rapport with the mother.
- The investigator explained and demonstrates the procedure, importance and the benefits of Kangaroo Mother Care (KMC) in order to create awareness and alleviate the fear and anxiety through power point presentation for 10-20minutes.
- The investigator obtained the informed written consent and assesses the demographic variables from the mother and the medical records.

Preparation of the articles:

Articles	Numbers	Rationale
A clean tray containing:		
Omron Digital thermometer	1	➢ To check the temperature of the preterm infants before and after KMC
Calibrated Portable pulse oxymeter	1	➢ To check the oxygen saturation and heart rate of the preterm infants before and after KMC
Cotton balls in a container	2	➢ To wipe the axilla and digital thermometer.
Calibrated Infant weighing scale	1	➢ To check the weight of the preterm infant before and after KMC
Kidney tray	1	➢ To collect the waste
Autoclaved cotton sheet	1	➢ To wrap and support the mother and the baby

Preparation of the environment:

- The investigator arranged all the necessary articles and switch off the fan, maintains privacy and maintains the room temperature.

Preparation of the investigator:

- The investigator arranges all the necessary articles at bedside and performs hand hygiene, wore cap, mask and apron.
- The investigator checked the preterm infant's physiological parameters such as Temperature, Heart rate, Respiration, Oxygen saturation, Weight and records immediately.

Preparation of the mother:

- The investigator asked the mother to perform maternal hygiene such as bath/sponge, change of clothes, hand washing, and cut short the fingernails.
- The investigator asked the mother to wear front-open light dress as per the local culture.
- The investigator assisted the mother in a comfortable sitting position.

Preparation of the preterm infant.

- The investigator undressed the preterm infant and the preterm infants worn only diaper during the KMC.

During the procedure:

- The investigator performed hand hygiene and place the preterm infant between the mother's breast in a perpendicular position such the head turn to one side in slightly extended position, flex and abduct the arms and hip in a frog like position. The investigator placed the preterm abdomen at the level of mother's epigastrium, asked the mother to hold the preterm infants, supports both the mother and the preterm by autoclaved cotton sheet for 30 minutes for three consecutive days.

After the procedure:

- The investigator placed the preterm in a comfortable position. The investigator checked and documented the physiological parameters after the procedure for three consecutive days. Preterm infants allowed performing their routine activities.

APPENDIX – K

PROTOCOL ON KANGAROO MOTHER CARE

Definition:

Kangaroo Mother Care is a non-invasive, non-pharmacological, motherly based care for the preterm infants by placing the preterm infants between the mothers breast in a frog like position, abdomen at the level of mothers epigastrium and support both the mother and the preterm infants by autoclaved cotton sheet for a period of 30 minutes for three consecutive days.

Purposes of Kangaroo Mother Care:

For infants

- To improve the physiological parameters of the preterm infants
- To promote breast feeding
- To Maintain optimum body temperature of the preterm infant
- To increase weight and reduce stress level of the preterm infant
- To enhance bonding between the mother and the infants
- To protect the infants from nosocomial infection
- To reduce incidence of respiratory tract disease of the preterm infant
- To reduce the length of hospital stays of the preterm infant
- To stabilize the systemic organ function of the preterm infant
- To improve cognitive development of the preterm infant
- To reduce pain responses of the preterm infant
- To improve sleep patterns of the preterm infant
- To promote auditory and sensory stimulation of the preterm infant

For the mother

- To improve confident to nurture their baby to relieve their stress
- To promotes attachment and bonding
- To improve parental confidence
- To promote increased milk production

Indications of Kangaroo Mother Care

- Preterm infants with stable physiological parameters.
- Preterm infants born between 26-36weeks of gestation
- Preterm infants weighing > 1500gm

Contraindications of Kangaroo Mother Care

- Preterm infants with hemodynamically unstable
- Preterm infants born before 26weeks of gestation
- Preterm infants with congenital anomalies
- Preterm infants whose mother is affected with contagious disease
- Preterm infants whose mother has impaired thermo regulatory process

Steps of intervention

Pre procedure

Steps	Nursing actions	Rationale
1.	Establish rapport with the mother	To win their confidence and interpersonal relationship
2.	Explain and demonstrate the procedure	To alleviate fear and anxiety to the mother

Preparation of the articles

Preparation of the articles:

Articles	Numbers	Rationale
A clean tray containing:		
Digital thermometer	1	➢ To check the temperature of the preterm infants before and after KMC
Calibrated Portable pulse oxymeter	1	➢ To check the oxygen saturation and heart rate of the preterm infants before and after KMC
Cotton balls in a container	2	➢ To wipe the axilla and digital thermometer.
Infant weighing scale	1	➢ To check the weight of the preterm

Articles	Numbers	Rationale
		infant before and after KMC
Kidney tray	1	➢ To collect the waste
Autoclaved cotton sheet	1	➢ To wrap and support the mother and the baby

Preparation of the environment:

Steps	Nursing action	Rationale
1.	**Preparing the environment** • Arrange all the necessary articles before beginning of the procedure • Maintain privacy and room temperature • Switch off the fan	Avoids need of leaving the baby
2.	**Preparation of the mother** • To perform maternal hygiene • To wear front open light dress • Sitting in a comfortable position	To prevent spread of infection Easy to carry the infants To reduce discomfort
3.	**During procedure** • Perform thorough hand hygiene • Dry hands with sterile towel or tissue paper • Wear personal protective equipment such as apron mask and cap • Observe the physiological parameters before KMC • Placing the undressed, the preterm infants between the mothers breast in a perpendicular position • Head turn to one side slightly extended position, flex and abduct the arms and leg in a frog like position and place the abdomen at the mother's epigastrium. • Support the mother and the infants by using the cotton sheet for 30 minutes.	Prevents spread of cross infection Maintains sterility of hands Promotes aseptic precautionary measures To know the baseline data of the preterm infants To promote skin to skin contact To maintain correct position of the preterm infants To prevent falls

Steps	Nursing action	Rationale
4.	**After the procedure** • Place the preterm infant in a comfortable position • Monitor the physiological parameters • Document the findings • Replace the articles	To allow to perform the routine care To know the improvement of the physiological parameters

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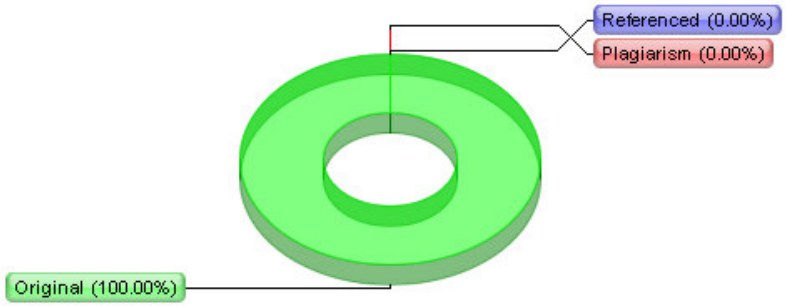

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APPENDIX – M

DISSERTATION EXECUTION PLAN – GANTT CHART

GANNT CHART																			
S.NO	**CALANDER MONTHS**	**Mar 15**	**Apr '15**	**May '15**	**June '15**	**July '15**	**Aug '15**	**Sep `15**	**Oct '15**	**Nov '15**	**Dec '15**	**Jan '16**	**Feb '16**	**Mar '16**	**Apr '16**	**May '16**	**June '16**	**July '16**	**Aug '16**
A	**Conceptual phase**																		
1	**Problem identification**																		
2	**Literature review**																		
3	**Clinical fieldwork**																		
4	**Theoretical framework**																		
5	**Hypothesis formulation**																		
B	**Design & planning phase**																		
6	**Research design**																		
7	**Intervention protocol**																		
8	**Population specification**																		
9	**Sampling plan**																		
10	**Data collection plan**																		
11	**Ethics procedure**																		
12	**Finalization of plans**																		
C	**Empirical phase**																		
13	**Data collection**																		
14	**Data preparation**																		
D	**Analytical phase**																		
15	**Data analysis**																		
16	**Interpretation of results**																		
E	**Dissemination phase**																		
17	**Presentation or report**																		
18	**Utilization of findings**																		
	Calendar months	**04**	**05**	**06**	**07**	**08**	**09**	**10**	**11**	**12**	**01**	**02**	**03**	**04**	**05**	**06**	**07**	**08**	**09**

APPENDIX – N

PHOTOGRAPHS

Investigator performed Hand Hygiene and wore on Apron, Cap, Mask

Investigator recorded the physiological parameters before the intervention

Investigator Performed KMC by placing the preterm infants between the mothers breast

Investigator assessed the physiological parameters after the intervention of KMC

Informed consent was obtained to publish the photographs in the Dissertation